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Berheide, Michael Charles

**METHODOLOGY AND METAPHYSICS: KARL POPPER AND THE PRACTICE
OF POLITICAL SCIENCE**

Indiana University

PH.D. 1984

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**METHODOLOGY AND METAPHYSICS:
KARL POPPER AND THE PRACTICE OF POLITICAL SCIENCE**

Michael C. Berheide

**Submitted to the Faculty of the Graduate School
in partial fulfillment of the requirements for
the degree Doctor of Philosophy in the
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Indiana University
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Accepted by the Faculty of the Graduate School,
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in partial fulfillment of the requirements for
the degree Doctor of Philosophy.

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METHODOLOGY AND METAPHYSICS:
KARL POPPER AND THE PRACTICE OF POLITICAL SCIENCE

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Contemporary political science suffers from a methodological schism which penetrates to assumptions about the place of values in a science of politics, the proper unit of analysis, the place of metaphysics and historical understanding, and even the possibility of practicing the study of politics as a "science". With a few notable exceptions, the profession has managed to paper over these controversies, reaching an uneasy orthodoxy which disguises its underlying methodological problems.

Methodological assumptions, however, are not without serious consequences. This dissertation makes the claim that methodologies based upon positivistic principles, such as behavioralism and certain varieties of historicism, cannot justify themselves, owing to an axiomatic denial of any role for metaphysical analysis. Such analysis is seen to be necessary in light of any scientific methodology's inability to justify itself, a

conclusion derived from Kurt Godel's Incompleteness Theorem, as interpreted and applied by Karl Popper.

Popper's use of incompleteness and of his own criterion of falsifiability in science is shown to be successful as a preliminary criticism of the assumptions of logical positivism and historicism. This analysis is then seen to be itself lacking in finality, in that Popper's own disavowal of metaphysics leads his program into an unacceptable relativism.

Michael Polanyi and Eric Voegelin are then used as examples of thinkers who would construct the metaphysical backing necessary for the ultimate success of Popper's arguments against both positivism and historicism. The result, as the dissertation concludes, is a political science capable of examining its methodological presuppositions and thus of learning and growing, and of utilizing historical studies in a constructive way.

Doctoral Committee:

Vincent Ostrom, Ph.D. Chairman

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PREFACE

This work has grown through several mutations, in the course of three years of researching and writing on the subject. Originally, it was to have been an examination of certain underlying assumptions of "modern" approaches to scientific inquiry and social inquiry in particular. These approaches were to be opposed to those of a class of critics whom I chose to call "philosophical". The underlying assumptions of these critics were, I believed, three in number: (1) the primacy and reality of a transcendent source of existence and its meaning, (2) "structural relativity", and (3) the status of the individual as the carrier of meaning in history. This special metaphysic of the critics, which I then believed was intellectually traceable to Plato, was to be opposed to counter-assumptions on the part of the moderns.

The enormity of such a task was pointed out to me at the time of my dissertation proposal, and it was decided then that a much less presumptuous estimate of my abilities indicated a rather severe restriction of scope. Accordingly, I decided to utilize the dissertation as a place to begin my intellectual maneuvers, and chose to concentrate upon the works of Karl Popper and his attack upon one element of

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"modernity" in social science: historicism.

Understanding Popper's criticism of historicism required a prior study of the methodological assumptions which he makes about the practice of science, however. In performing such a study, I uncovered an important and to my knowledge unnoticed characteristic of Popper's criticism: it simply did not go far enough. His assiduous avoidance of metaphysics caused him to rely upon conventional acceptance of his rules for the "game" of science, and left these rules bereft of any real justification -- even according to his own argument. This, I believe, leaves his argument open to a serious problem of relativism, obviating his attack on historicism as engendering precisely that difficulty.

I realized then, and remain convinced, that methodological discussion in political science remains severely hamstrung, owing to the fact that certain methodologies which are party to the controversy assume the validity and decidability of metaphysical statements, while others axiomatically exclude metaphysical problems from serious inquiry. Thus, the controversy seems to remain undecidable, for the simple reason that decidability is the issue at stake.

Thus far, I side with the metaphysicians. No rule

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of science, as I argue in the dissertation, can be justified without an appeal to "meta-scientific" -- or metaphysical -- arguments. It is therefore the case that those methodologies which exclude metaphysical statements in principle cannot justify themselves. It furthermore turns out that this applies to Popper's own rules, good as they are.

This brings up a necessary disclaimer. This dissertation should not be considered an argument for or against the use of any particular methodological technique, say, statistical and survey methods, content analysis, historical case studies, or philosophical anthropology and literary interpretation. All techniques are appropriate when they are appropriate. It is an argument against the uncritical application of methodological techniques and against a principled ignorance of metaphysics. It will incidentally also be an argument against a too-strong reliance upon the methodological distinction between "facts" and "values", against defining science as the investigation of facts and denying the possibility of an objective analysis of values.

To the extent that all this is successful, I owe inestimable thanks first of all to my parents, Charles and Martha, who taught me to think about both values

PREFACE

and facts at an early age, and to my professors, especially Dr. Vincent Ostrom, whose own work has inspired me and whose constant criticism and interest kept me at my own. Many discussions with Richard Merriman, my friend and colleague at Indiana and Berea, helped greatly in clarification, as did his comments on previous drafts of this work.

To the extent that this work is unsuccessful, I credit my humanity and Kurt Godel, whose work has taught me to expect and embrace incompleteness in a universe that is tragically ordered.

Many thanks are also due to Berea College, who through the agency of Dean William F. Stolte paid my tuition at Indiana University while I completed this work, and whose PRIME 400 computer made possible several drafts. Thanks, L.D., Bill, and Mark.

Above all, I owe more than I can say to my wife and critic, Becky, without whose presence I simply would not be the way I am. This work is dedicated to her.

I. INTRODUCTION: THE PROBLEM OF METHODOLOGY
IN POLITICAL SCIENCE

In the study of creature, one should not exercise a vain and perishing curiosity, but ascend to what is immortal and everlasting.

-- Augustine, De Vera Religione

Methodological Warfare

In the course of the past century, the discipline of political science, and especially that part of the discipline which takes as its subject matter the theoretical analysis of the relationship between government and society, has been rocked by a series of methodological arguments and perhaps even some methodological "revolutions". The first great conflict occurred when traditional approaches to the study of politics, begun perhaps by Plato and Aristotle, were sharply attacked by that school of thought self-characterized as "positivism". Following this development, and indeed logically extending from it, came the "behavioral revolution", a mixture of positivism and psychological behaviorism. Finally, in perhaps an incomplete revolution, claims have been made that political science has arrived in what is called

its "post-behavioral" stage.

It is easy to characterize these different methodological strata as simply changes in emphasis on the part of social scientists, or as perhaps the natural results of progress in the use of newly-discovered techniques of investigation. But this is not sufficient to explain the ferocity with which the debate has proceeded. Somit and Tannenhaus (1967) have characterized these various disputes as a series of "internecine wars", representative of an almost unbridgeable gap between opposing camps. To be sure, these authors are relatively sanguine about the future of political science (considered from their 1967 perspective), declaring that, while "the discipline will become more behavioral in tempo ... paradoxically, the 'scientific' aspirations of behavioralism will become progressively more modest in tone and scope." (1967: 208)

Yet this rather modest projection, as the authors admit, is based largely on certain historical characteristics of the profession. In the first place, the lack of a unifying methodology has thus far not destroyed the profession, indicating "an enviable capacity to reconcile the near-irreconcilable", (1967: 206) and the authors see this admirably tolerant

attitude continuing into the foreseeable future.

Secondly, the "de-escalation" of methodological warfare will be aided by what appears to be a partial victory by the behavioralist camp: behavioralism, they tell us, will continue to become more popular, as it succeeds in capturing key positions within "the power structure of the profession" and within the academy.

(1)

Methodological Choices

Yet surely the long-term future success of the discipline will not be ensured by the sublimation of methodological squabbling through either the authoritative imposition of orthodoxy or an attitude of noblesse oblige towards the heretic elements of the profession. For the intensity of debate over methodological choices is not the result of principled misunderstandings and surliness, nor is it merely a matter of taste: it is rather the result of a deeply-set, albeit sometimes uncritical, awareness that methodological principles are intended to reflect fundamental truths about reality.

I shall argue in this dissertation that methodological principles are useful only when they

comport, in some fundamental sense, with our experience of reality. This is not a surprising notion, for clearly a methodology which would, for example, champion illogical behavior in scientific investigation would not be suitable in a world which we experience as consistently ordered, for the principles of that methodology would fail to reflect that world, and lead us far astray in our search for truth about it. Thus, the rules of a methodology are more than just articles of convenience, to be applied or not as the mood strikes us. They must instead be carefully crafted and applied according to our interpretation of the structure of reality, that they might aid us in further interpreting and understanding that structure.

Methodologies, therefore, are regarded by those who propound them with critical awareness, as the bearers of truth. Those who would attack and replace these methodologies are then understood as the purveyors of falsehood, perhaps even as perverse and fraudulent. This is not the type of situation which leads to easy accomodation and amicable tolerance. Within the profession of political science, entire careers have been built or destroyed, not on the basis of seminal discoveries and watershed theoretical advances, (2) but on the use or defense of some

particular methodology.

While methodologies may be characterized as making certain assumptions about the underlying reality which they aid us in examining, it is nevertheless true that practicing scientists are not always, or even often, critically aware of these assumptions. Most of what Kuhn (1970) describes as "normal science" may be understood as occurring precisely when such critical awareness is not forthcoming and as he notes, this seems to be the usual state of scientific behavior.

(3)

Being unaware of the assumptions of a methodology is not the same thing as being unaware of personal assumptions of the scientists. Indeed, as in the case of a behavioral approach, one assumption which a methodology may entertain (4) may be that the personal assumptions of the scientist must be subject to constant critical scrutiny. Methodologies, used with care, may then aid us greatly in "objectifying" our search for knowledge, by forcing us to remove irrelevant personal prejudices and idiosyncracies from our investigation, or at least to assess their impact on that investigation. But this is not the primary concern of the dissertation. Subjecting personal assumptions which we bring to our investigations to

critical scrutiny is a good and proper enterprise, a good methodological principle, but none of the methodologies contending for prominence in political science seriously maintains otherwise. And political scientists by and large seem remarkably successful in accomplishing this.

The more serious problem, with which we are here concerned, is that improper methodological assumptions may produce results every bit as disastrous as improper personal ones, and that while following methodological rules may protect us to some degree from the latter, it cannot protect us from the former. Methodological rules do not, and cannot, carry with them their own justification, as the dissertation will make clear. We must therefore aspire to a sincere criticism of methodologies, if we are to avoid ones which trap us in assumptions which we do not intend to make, and which eventuate in bad science.

Unfortunately, the paradoxical aspects of the profession which Somit and Tannenhaus regard as ensuring its survival, i.e., its historical methodological promiscuity and its tendency to reward methodological orthodoxy, at the same time reduces its awareness of its own assumptions, thereby contributing to what may be its eventual downfall. Most of us in

political science have come by our methodologies as the result of our training, rather than through a critical investigation into the necessary characteristics of a good methodology. We are taught methods and techniques, and only rarely the fundamental principles on which such techniques are based. Still less often are we made to understand the reasons for such fundamental principles, reasons which, as noted, must come from outside the methodology itself.

The "enviable ability to reconcile the near-irreconcilable" cited by Somit and Tannenhaus does not really refer to an ability to synthesize disparate principles in a critical manner, but rather to an historical tendency simply to ignore the ramifications of these disparities. Each methodological camp agrees to forgo serious criticism of the others, provided that payment is returned in kind, and thereby ensures that its practitioners may comfortably continue to grind out conclusions which are unchallengeable on methodological grounds -- the most difficult of grounds to defend.

Thus the "internecine war" over methodologies may indeed move from a damaging exchange of salvos, through an agreement to cease fire, to an uneasy detente, in which a few occasional flare-ups, none taken too seriously, may be expected. This final stage may in

fact characterize the "post-behavioral" era in which political science is now sometimes presumed to reside.

(5)

But the natural antagonisms of competing methodologies will not go away in the face of affability and orthodoxy, no matter how much we congratulate ourselves. For the critical problems of methodological assumptions still remain. Lack of awareness does not make the thing of which we are unaware disappear, and if that thing happens to be the cause of problems, our lack of awareness will only serve to exacerbate them.

The present work seeks two simultaneous goals: to establish the primacy and value of analyzing methodological assumptions and to present such an analysis by examining in particular the methodological claims of three eminent thinkers: Karl Popper, Michael Polanyi, and Eric Voegelin. In so doing, the work will concentrate primarily on those methodologies which Somit and Tannenhaus claim make up the core of political science today: behavioralism, its ancestor, positivism, and its close relation, historicism. The analysis of methodologies will proceed on two distinct but interrelated levels. The three thinkers mentioned present their own methodological prescriptions in the

context of criticism of other contemporary approaches. Not coincidentally, these happen to be positivism, behavioralism, and historicism. We will therefore examine these criticisms as an aid in establishing the principles of debate over methodology and in furthering our understanding of the methodologies under attack. In addition, however, all three thinkers propose to place their own principles in the vacuum believed left by their criticism. Our analysis will at the same time, therefore, be an analysis of these newly-contending ideas.

Before we proceed to the task, however, it will be useful to present a brief overview of these ideas and their interrelationships, although it is not feasible to outline a detailed history. (6) Let us begin first with the principle assumptions underlying the study of politics before the advent of twentieth-century methodologies, methods which may be loosely grouped under the term "traditionalism".

Traditionalism, Positivism, and Behavioralism

The word "traditionalism" is more or less a catch-all to include traditional political science as it was practiced before the advent of positivism and

behavioralism. Indeed, the word itself seems to have been coined only after the advent of these newer approaches, as a way of categorizing all the things to which they were opposed. This practice was not unified by any one methodology, but rather by a common goal. Robert Dahl's contention is that this goal was in general to provide an answer to the question "What is a good society?" (7) The lack of a unifying methodology makes it difficult to examine the competing claims of traditionalism and positivism to being the better approach to the study of political science, but this lack does not mean that traditional approaches did not have certain unifying assumptions about the nature of the subject matter.

In his 1969 collection of readings surveying Behavioralism in Political Science, Heinz Eulau writes that the "intellectual battle lines" between behavioralism and traditionalism, while not drawn very sharply, center around three critical issues:

1. Disagreement over the nature of the knowledge of political things.
2. Controversy over the place of values in the study of politics.
3. Disagreement over the basic "unit of

analysis" in the study of politics. (Eulau, 1969a: 3)

We may accept these for the momentary purposes of discussion here.

Knowledge of Political Reality

The traditional (or "ancient", to use one of Eulau's terms) approach to political study has been a "philosophical" one, rather than a "scientific" one, according to Eulau, with an emphasis on reason fettered only by the demands of logic, and an inwardly-directed search for the nature of man. The modern behavioralist opposes such activity on the grounds of its manifestly "subjective" nature, and proposes in its place the possibility of establishing a scientific approach which favors the observation of the "empirical" aspects of political life, and their explanation "by means of methods, theories, and criteria of proof that are acceptable according to the canons, conventions, and assumptions of modern empirical science." (Dahl, 1969: 77) The controversy is therefore first of all an epistemological one, asking how we best come to know the stuff of politics, and opposing Socrates' early

injunction to "Know thyself" to a regard for the political behavior of others.

Facts and Values

The second area of contention, over the place of "values" in a study of politics, displays for us in heightened relief a fundamental, perhaps irreconcilable difference between traditional approaches and the doctrines of positivism. Much will be made of this controversy in the dissertation, but a short exposition of it is proper here.

There is one overriding claim on which positivism is based. That is the claim that only "observable" events in empirical reality are properly the subject of rational and scientific investigation. This is the core assumption of positivism, and the various subsidiary assumptions which belong to this or that form of positivism may be shown to be derivable from it. There is, for example, the positivist distinction between "fact" and "value", which by now is familiar to any collegian. In its more general form, this claim asserts that values are not a part of empirical reality, and that therefore they cannot be the object of rational analysis. In its behavioralist form, the

claim is made that values, while they may or may not be real, are in any case not observable, and the best we can hope to do is observe the translation of these values into behavior. Again, this precludes rational investigation into the value which is prior to behavior. Finally, there is that brand of positivism, typified by Wittgenstein, which holds that values, ideas, and ideals, are merely expressive phonetic constructs, expostulations really, and as such not only defy empirical observation, but furthermore have no meaning. (8)

Traditionalists, in attempting to deny any of these assumptions, find their arguments carefully pushed backed to the distinction between facts and values. In order to attack the behavioralist standpoint or the standpoint of linguistic positivism, the traditionalist must assert that on some level there is no distinction between facts and values. At least he must assert that this distinction is not as clear-cut as the positivist would claim.

The inclusion of Strauss' famous essay "What is Political Philosophy? The Problem of Political Philosophy", (9) in Eulau's collection indicates the seriousness with which he treats this problem, as the essay stands out as the only one dramatically opposed

to behavioralism, and it is opposed on precisely the grounds of the fact-value distinction. (10)

Strauss provides an excellent example of traditionalism's goal, as Dahl has formulated it:

All political action has ... in itself a directedness toward knowledge of the good: of the good life, or the good society. For the good society is the complete political good. (Strauss, 1969: 94)

Political philosophy is the task we undertake when we explicitly acknowledge this search for the good, although it is at least implicit in all political activity. But according to Strauss, this pursuit of the good is now under attack by positivism and behavioralism, which reject it as unscientific. (Strauss, 1969: 99) This rejection is based completely on the positivist's recognition of a qualitative epistemological difference between facts and values, and his consequent attempt to structure a social science which is "value-free". Strauss completely dismisses this objective, giving us four reasons why a value-free political science is an impossibility, and why the attempt to implement such a thing must lead to disaster.

First of all, it is "impossible to study social

phenomena ... without making value judgements." (Strauss, 1969: 101) One simply cannot observe such phenomena without filtering them through a complex web of value-judgements, both on the part of the political actors being studied and on the part of the scientist. We will see later that Polanyi asserts the inherently evaluative nature of all pronouncements concerning factuality.

Secondly, the positivist-behavioralist rejection of value judgements "is based upon the assumption that the conflicts between different values or value systems are essentially insoluble for human reason." (Strauss, 1969: 103) Indeed, this is the very reason for the delineation between facts and values in the first place. Only statements about facts may be examined according to recognized principles of reason, say the positivists, and if these principles constitute science, there can be no place for the study of values in science. Strauss, Polanyi, and Voegelin all reject this notion, and maintain instead that the consideration of values is every bit the rational enterprise that the consideration of facts is.

Thirdly, the positivistic elevation of scientific knowledge to the "highest form of human knowledge" implies an illegitimate depreciation of "prescientific"

knowledge. Indeed, in extreme cases such as Comte or Descartes, it may explicitly deny any value whatsoever for this type of knowledge. (Strauss, 1969: 104) Strauss understands by this term "prescientific" both a type of "common sense" knowledge -- "things which every ten year old child knows" (Strauss, 1969: 104) -- and knowledge arrived at in a purely dialectical fashion. Only such knowledge is capable of dealing with "primary or fundamental questions" and its neglect or disavowal leads to a "thoughtless acceptance of received opinion." (Strauss, 1969: 105)

Of particular importance in political science is the "prescientific" question of just what distinguishes political things from things which are not political. This type of question, Strauss asserts, cannot be answered scientifically (as the positivists define science) but only dialectically. (Strauss, 1969: 106) We will see that this objection is akin to that raised in the dissertation in the course of criticizing Popper: methodological rules cannot be used to justify their own applicability. Only a "meta-scientific" analysis of such principles can provide the needed criticism. And if positivism denies the possibility of metaphysical -- "prescientific" -- knowledge, the selection of methodological principles becomes

arbitrary and groundless.

Finally, Strauss maintains that positivism "necessarily transforms itself into historicism." (Strauss, 1969: 106) By refusing to analyze the value structure inherent in political behavior, positivism runs the risk of mistaking momentary peculiarities of a particular society for essential characteristics of all human society. In order to avoid this problem, it must engage in "cross-cultural" research, in an attempt to delineate truly constant social factors from merely epiphenomenal ones. But in so doing, it will necessarily misunderstand the meaning of these cultures "because it interprets them through a conceptual scheme which originates in modern Western society". That scheme is the scheme of modern science, "which reflects that particular society, and which fits at best only that particular society." (Strauss, 1969: 106)

Other cultures do not necessarily understand themselves from a scientific viewpoint, and our ability to understand them rests upon our recognition of the way in which they understand themselves. (11) The empirical social scientist can attempt to acquire this understanding only by viewing such cultures in some historical context. This is not in and of itself bad. It is in fact a part of all proper studies of politics.

But the type of "history" which the positivist can use will amount to no more than an uncritical compendium of "objective" facts, and such a history is simply not possible.

All historical analysis must be undertaken from within a framework of directed interests, and such interests must necessarily be based upon "subjective" evaluations of problems. To avoid this, the empiricist must attempt a strictly "scientific" analysis of history itself, to discover its fundamental structure and the laws of its movement. This attempt defines historicism, the "serious antagonist of political philosophy." (Strauss, 1969: 107) Popper's excellent criticism of such an enterprise will be discussed in the following chapters. In one sense at least, Popper's criticism will be seen to boil down to Strauss' final comment on the problem of historicism:

Historicism rejects the question of the good society, that is to say, of the good society because of the essentially historical character of society and of human thought: there is no essential necessity for raising the question of the good society; this question is not in principle coeval with man; its very possibility is the outcome of a mysterious dispensation of fate. (Strauss, 1969: 108)

Eulau takes issue with Strauss over the question

of whether a behavioral science of politics must necessarily lead to the type of "moral neutralism" and even nihilism which Strauss decries. He claims that Strauss has "failed to stem the tide of behavioralism in political science. ... because his method of arriving at truth [i.e., the prescientific method] does not recognize empirical reality and does not permit intersubjective validation of that reality." The reality which Strauss fails to recognize is simply that behavioral scientists are in fact not "contemptuous of values nor disinterested in public policies." Just because behavioral scientists assert that values cannot be composed scientifically does not mean that they cannot be investigated by a process of pointing out the empirical consequences of alternative choices. (12)

Eulau asserts that values can and should be studied by the methods of science, but his idea of what a "study of values" is and Strauss' idea are really quite different. For Eulau, it involves first of all the determination of what values political actors bring to bear on their activities (not "what is good?", but "what do people think is good?"), and secondly the relationship of these values to scientifically predictable outcomes of policy choices. That is, Eulau is concerned with showing how a given set of values may

be optimized by the careful selection of policy alternatives whose outcomes can be predicted by science. The actual investigation of whether these values are good and proper themselves he leaves to the study of ethics. He does, however, seem to agree with Dahl's contention that true excellence in a political scientist may consist in an ability to shift rapidly from one approach to another. (Dahl, 1969: 87)

Strauss, on the other hand, is really contending that no shift is necessary, for in truth the study of politics and the study of values must proceed simultaneously and are indistinguishable in essence -- much as Plato would have us study the polis as "man writ large" to understand justice, and study justice to understand political behavior. The basic controversy over the place of values in the study of politics is therefore not overcome by the behavioralist's assertion of his willingness to study values scientifically.

We have dealt at length on this second of the controversies identified by Eulau, for it is clearly the most important, based as it is upon a fundamental disagreement over the nature of reality. Let us finish the discussion with a brief explanation of Eulau's third point, however: the controversy over what constitutes the basic unit of analysis of political

studies.

The Unit of Analysis

Traditionalists, Eulau asserts, generally believe that political study should confine itself to an institutional level of analysis, while the behavioralists assert that the individual human actor should be the focus of our attention. Traditionalists have concentrated on describing the formal and informal structures of political institutions, on analyzing their actions as institutions according to legal-theoretical principles, on assessing the relationship between structure and actions, and on evaluating the consequences of these actions in terms of their impact upon institutional characteristics.

But to the extent that behavioralism is concerned with institutions, it is, as David B. Truman notes (1969: 45), principally concerned with "explaining the effects of a given institutional pattern on the behavior of the individual and not with explaining or even describing the operation of the institution itself." When this concern does approach the analysis of institutions, it is usually undertaken from the standpoint of viewing institutional characteristics and

activities as the results of agglomerated individual ones.

The discussion of the place for methodological individualism in the social sciences will be found later in the dissertation. Let us note here only that we will see that as a principle of investigation, it has some very solid metaphysical backing, but that there is nevertheless a danger in proposing the extreme view that only individuals are fit objects of political study, for the institutional effects on political behavior are not negligible, and deserve consideration even in a science whose basic unit of analysis is the individual. (Truman, 1969: 58-61) The neglect of institutional effects can lead to a prepossessing historicism, as Popper shows.

Positivism, Metaphysics, and History

Positivism as a philosophy was constructed to combat some real problems in scientific investigation, such as the lack of unifying methodology mentioned above, and it has its advantages. As formulated by early investigators in the natural sciences, such as Bacon and Newton, and subsequently by social scientists such as Comte, positivism was a direct response to the

problems of extreme scholasticism. It purports to establish an independent basis for scientific knowledge, and permits the development of a systematic methodology, i.e., rules of inquiry by which we should be able to determine objectively the soundness of our observations. But positivism has its disadvantages as well. The argument that we can delineate between objective fact and subjective value cannot be made on positivistic grounds, for non-observability cannot be observed. Nor, by the positivists' own admission, may this distinction be accepted on metaphysical grounds, for at the very least metaphysics is not science, according to positivism, and therefore its conclusions cannot be trusted. And at the most, positivists claim that metaphysical statements have no meaning, and therefore are worse than useless. Most importantly for the purposes of this dissertation is the fact that the positivist reliance on method as a defining characteristic of science tends to eliminate or distort potentially useful modes of investigation, such as historical analysis and philosophical anthropology, on the grounds of maintaining methodological purity.

In some sense, this dissertation is also concerned with the recovery of the study of history as a tool for political science investigation. To do this, it is

necessary to complete two tasks: the first is to show that history is an area susceptible to intelligent analysis, that it is more than simply the mere collection and arrangement of "facts". For if history is no more than this, it can have no theoretical relevance, and hence cannot be used even in a supporting role for the study of political science. As Dahl rightly observes, "the a-theoretical or even anti-theoretical biases of many historians often make their works a storehouse of data so vast as to be almost unmanageable for the theorist" (Dahl, 1969: 89), and Popper and Voegelin agree on precisely this point. If, alternatively, facts are facts only in some larger theoretical context, there can and will be theories of history which may be utilized by political scientists.

The second task is to show the theoretical links between a study of history and a study of politics. This will not involve merely collapsing the fields into each other, by declaring history to be "past politics" or politics to be "contemporary history". Instead, we must show that although the two fields are separate, they are inextricably linked in the sense that an adequate understanding of the one cannot proceed without a similar understanding of the other. This may

sound paradoxical, but all it means is that the investigations proceed simultaneously as the result of inquiry into the principles of ordered social behavior.

If these two points can be made, an argument in favor of the reintroduction of the historical element into political science research will be established. This should be considered a "reintroduction" because, as Voegelin will tell us, the two modes of investigation were originally linked together at their inception, but have been disincorporated over the past century or so by the various "revolutions" noted above. Each of the three thinkers examined in this work has contributed a different important part to the establishment of this argument, and each part embellishes and complements the others.

A complete defense of this reunification is not the primary point of this dissertation, however, so the reader will not find analysis centering on this point. This work represents only a start at releasing the study of history and politics from their historicist and positivist encumbrances, in order to permit further investigation. Moreover, the lack of competence in this area on my part makes the examination of the thought of others the best way to begin such an enterprise. I have therefore chosen to concentrate on

the three thinkers mentioned above.

Popper, Polanyi, and Voegelin

Karl Popper would not, at first glance, seem to be a likely candidate for inclusion among those thinkers who would rank historical studies high in importance for the study of political science or the social sciences in general, for his two major works in the area of history, The Open Society and Its Enemies and The Poverty of Historicism, challenge the attempts by some scholars to claim that the only way to study "sociology", as he calls it, is through the study of history. Popper takes this notion apart, and shows that the type of history with which these thinkers are concerned does not and cannot form an adequate basis for social science. The most it can hope to do is to inform somewhat the social sciences by providing for them starting points in the form of critical social problems, and by illuminating examples of similar problems in the past. Popper makes his point through an in-depth investigation into the problem of scientific knowledge, showing that the knowledge which the "historicists" claim cannot be classed as scientific knowledge. If we are to have a scientific

study of society and politics, then, we may not rely on this approach.

But Popper has, I think, accomplished much more. What he has attacked is a stunted view of historical study which has developed alongside and in response to the positivist influence in the social sciences. By dismantling this pervasive approach to history, Popper leaves open the possibility that other approaches to history can be valuable, including his own approach which utilizes it for the stipulation of critical problems and investigation into the "logic of the situation". Furthermore, his approach to the philosophy of knowledge, particularly knowledge in the scientific sense, also goes a great distance towards dismantling the severe positivism which has influenced political science and which has thereby prevented adequate appreciation of historical studies.

As mentioned earlier, part of the problem of positivism comes in the form of the "fact-value" distinction. A positivist historian can succeed only in amassing huge quantities of historical "facts". Passing judgment on and evaluating these facts cannot be included in his inquiry, remaining instead a separate task. Popper maintains a type of fact-value distinction in his philosophy of knowledge, but he

manages to blur it somewhat by changing it to a distinction between facts and decisions. Facts are not decisions, and, while decisions are facts, they are a particular type of non-scientific fact. Critical decisions involve which facts are to be accepted, and this acceptance depends upon the particular relevant critical problem which the scientist is investigating, and it is here that historical investigation can help. Popper's analysis remains incomplete, however, owing to what we shall see is a certain aversion to metaphysics, and so our own analysis will continue by examining Polanyi and Voegelin, who have no such compunctions.

Polanyi does not concern himself as directly with the problem of history and historical investigation as does Popper, preferring instead to concentrate on the problem of scientific knowledge, and to utilize his findings in the field to comment on social scientific investigation. We will see, however, that his destruction of the distinction between facts and values goes a step farther than Popper without violating his basic premises, and incorporates "personal values" into the facts of science themselves. This would remove the basis from which the positivists can make their criticisms of theoretical history, and with the possibility of such an analysis open, the further

possibility of a recovery of historical analysis in political science is attained.

These first two critics came to the problem of social science investigation by similarly circuitous routes. Popper was a physicist, and still regards physics as the prototypical science. He soon became involved in the philosophy of science, in particular the problem of how scientists know what they know. The rise of modern political ideologies and World War II gave Popper the impetus to apply his findings in this field to social and political problems, and to the study of politics. (Popper, 1976: secs. 23 and 24)

Polanyi began as a chemist, and again very quickly pushed the problems of methodology in chemistry and biology to the point where they became problems of epistemology. Again, the leap was made from the problems of knowledge in the natural sciences to the problems of knowledge in the social sciences, and again the leap was caused, by his own admission, by contemporary social and political disorder. (see esp. Polanyi, 1974)

The third thinker who we will be examining, Eric Voegelin, came at the problem more directly. Originally trained as a professor of law with rather positivist leanings, he soon became disenchanted with

the limitations of such a form of inquiry. In particular, he reached the conclusion that such a methodology could not lead to any kind of an understanding of the nature of modern mass political movements. (Sandoz, 1981: chap. 2) Finally, Voegelin seems to have come to the realization that the warped nature of major contemporary studies of history seemed to have a direct effect on the study of political science, preventing an adequate understanding of the nature of contemporary political culture, as well as of the political cultures of the past. (Voegelin, 1968: 4-7) In criticizing these "derailed" philosophies of history, he formulated his own philosophy of history in opposition to them, based upon an "anti-positivist" view of reality.

Now the discoveries and thoughts of these three men are not going to change the face of political science at any time in the foreseeable future. In the first place, they are not widely read or known. Secondly, when they are read, they are widely misunderstood, owing in part to the difficulty of the subject matter and in part to the natural recalcitrance of the members of the professions being criticized. And finally, even when they are read and understood, they face some valid criticism from several quarters,

and some criticism on dogmatic grounds. We may discount the latter, but the former have some importance and call into question some very real problems in their writings.

The Course of the Work

The next chapter begins our analysis with an examination of Popper's work in the area of the "logic of science", as he calls it. We begin with his discussion of the "problem of induction" and his proposed solution in the form of his line of demarcation and the concept of falsifiability in science. From this we proceed to an analysis of the problem of conventionalism, as it is to be found in Popper, with a brief excursion into the idea of incompleteness.

Chapter 3 will then analyze Popper's attempt to apply his principles of science to the subject of "historicism", a modern treatment of history and social science which he finds to be defective. It is seen to be defective in two ways: his early analysis concentrated on showing that an historicistic approach to social science was in fact bad science and doomed to fail. Chapter 4 will examine his claims in this

regard, especially his views on the problem of the need for "frameworks" within which investigation must proceed, and the need for interpretation in history.

In chapter 5, we will discuss the second of Popper's objections to historicism: that it is false, in addition to being simply unscientific. In making this claim, Popper has recourse to Godel's work on the necessary incompleteness of our knowledge, and expresses his own point of view through his idea of the "three worlds" of reality. In this chapter, however, we will also make the claim that Popper's assiduous avoidance of metaphysics stunts his analysis by finally forcing it to rely upon conventionalism, with all the problems attending it. The point will then be made that, while Popper's analysis is helpful as far as it goes, without a willingness to engage in metaphysical discussion, and to admit that such discussion can have serious value in science, he cannot defeat the doctrines which he so detests.

In chapter 6, we will present arguments from Polanyi and Voegelin as potential candidates to extricate Popper from his difficulties. Neither thinker contradicts the core of Popper's criticism, except for one primary point: they do not accept Popper's division between science and metaphysics. The

exclusion of certain types of questions and topics from scientific inquiry is what is responsible for Popper's problem, and with the disavowal of this distinction, it may become possible to provide a solid and real basis for Popper's criticism.

Finally, in chapter 7, we will attempt to sum up the argument, and pull everything together in a manner which expresses some of the consequences this analysis has for the practice of political science. In particular, we will address the consequences of a non-positivist study of history, of the general incompleteness of knowledge, and of a purposefully evaluative science.

(1) According to Walter B. Roettger, these developments have indeed taken place. His replication of Somit and Tannenhaus' work (Roettger, 1977a) leads him to the conclusion that the study of political philosophy is declining in importance in the profession, in favor of training in quantitative methods, "as older age cohorts exit the discipline". (Roettger, 1977: 1)

(2) Indeed, the common-sense and even trivially true nature of many "findings" in the profession is sometimes a source of some embarrassment to sensitive political scientists. Many of us have often experienced the "Big Deal" syndrome in our students, after having carefully and methodically pointed out that children are likely to identify with the political party of their parents, that Republicans seem on the whole wealthier and more "conservative" than Democrats, and that the President wears many hats. There is, of course, a danger of overstatement here, since much that is valuable has been done in political science, and in social science in general. Nevertheless, the point is well-taken. A short trip through any recent American Political Science Review will turn up a number of observations that "further investigation is necessary" in order to uncover some truly "important" findings. Usually, these are accompanied by a call for more rigorous application of this or that methodology, which was precluded by the peculiar circumstances of the current study.

(3) We will see later that Popper (1970a) objects to Kuhn's analysis on the grounds that Kuhn's "normal science", while perhaps "normal" in the sense of being historically usual, is not "normal" in the sense of being proper. In fact, for Popper the proper state of scientific investigation more clearly resembles Kuhn's "revolutionary science", in that it is always characterized by a conscious willingness to examine the fundamental assumptions made in the course of investigation.

(4) Note that we are speaking metaphorically here -- methodologies, not being conscious entities, do not "assume". The authors of these methodologies do, and their assumptions are incorporated into their methodologies in the form of fundamental axioms.

(5) We will not concern ourselves here with an

analysis of "post-behavioralism" in political science, except to note that this "era" seems characterized only by a less strident controversy surrounding the same old debate between traditionalism and behavioralism. Excellent treatments of post-behavioralism may be found in Roettger (1977, 1977a), Graham and Carey, eds. (1972), and Green and Levinson, eds. (1970).

(6) The reader interested in such a detailed history should refer to the excellent treatments of Somit and Tannenhaus (1964, 1967) and Roettger (1977, 1977a). More general treatment of the history of positivistic influences in philosophy and science may be found in Russell (1945), and Bergmann (1967) provides an excellent overview of some standard positivistic principles.

(7) In the Introduction to Polsby, et al, 1963. The question is opposed to such behavioralistic questions as "what is society like?" and "how does this society work?".

(8) I am indebted to Dr. Vincent Ostrom for reminding me that this position is true only of the early Wittgenstein, and that his later work presents considerable modification of this view.

(9) Strauss, 1969. Originally published in the Journal of Politics, 19 (August 1957), pp. 343-355.

(10) Christian Bay's essay, "Politics and Pseudopolitics: A Critical Evaluation of Some Behavioral Literature", is the only other critical essay included, but Bay primarily directs his criticism against certain undesirable practical consequences of the behavioral approach. Strauss' essay is the only one attacking fundamental principles of behavioralism. Cf. Bay, 1969. Originally published in the American Political Science Review, 59 (March 1965), pp. 39-51.

(11) We will see that this "self-interpretive" characteristic of societies is an important object of investigation in Voegelin's "philosophical anthropology" approach.

(12) Eulau, 1969a: 11. Eulau is here paraphrasing Gabriel Almond (1946).

II. THE LOGIC OF SCIENCE

Wherefore the natural measure whereby to judge our doings, is the sentence of Reason determining and setting down what is good to be done.

-- Hooker, "The Laws of Ecclesiastical Polity"

Before we examine Popper's analysis of historicism and his understanding of the role history must play in political science, we must first of all come to grips with his treatment of scientific knowledge in general. Much of his criticism of historicism revolves around his observation that it either attempts to turn history into a scientific enterprise, which Popper claims cannot be done, or tries to deny the possibility of any scientific study of society, claiming instead that we can only understand social and political affairs "historically". Both of these claims involve a fundamental misunderstanding of the methods and aims of science, according to Popper, so it is to his understanding of this nature that we now turn.

The Problem of Induction

Probably Popper's finest and most influential work

is his The Logic of Scientific Discovery (1968), originally published as Logik der Forshung in Vienna in 1934. In this work, he tries to lay out the fundamental principles of scientific analysis and discovery. Popper regards as one of the greater difficulties facing anyone willing to deal with such a topic "the problem of induction"; that is, how one deals with the apparent fact of basing a scientific conclusion upon the consequences of an inductive logic.

This problem has appeared critical to thinkers throughout the history of science. At the very beginning of the "scientific revolution" of the Enlightenment, Sir Isaac Newton makes the claim that scientific method proceeds on the basis of induction:

... I frame no hypotheses; for whatever is not deduced from the phenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy. In this philosophy particular propositions are inferred from the phenomena, and afterwards rendered general by induction. (Newton, 1932)

The standard distinction which is made between induction and deduction is that in the latter case general statements are combined with principles of logic to yield specific conclusions, while in the

former the process is exactly reversed. (1) The problem of induction may be expressed as the following two-step problem. If we wish to derive specific conclusions, we must have both general laws and an acceptable mode of derivation. We have, since Aristotle, developed deductive logic to the point where there is no important disagreement over whether basic principles of deductive logic are generally valid as such a mode of derivation. We are still presented, however, with the prior acceptance of some general law to which to apply these principles. The overwhelming question of philosophy of science is how we can justify holding such general laws to be true, and as a subsidiary question we ask how we come to construct such general laws.

Induction has been touted as the answer to these questions. Presumably, over a period of time we observe similar events occurring under similar circumstances. If these occur often enough, we somehow formulate the conclusion that these events always occur under these circumstances. We then have a general law which may be "post-processed" through deduction. The problem, of course, is that we have no logical structure comparable to deductive logic which permits us to draw this conclusion. In deductive logic, we

say, the conclusions are "forced" by the combination of argument and premise. But there is really no set of knowable logical rules which force or entail the leap from a mass of specific events to a general law covering those events. Hume expresses the paradox succinctly:

Thus not only our reason fails us in the discovery of the ultimate connexion of causes and effects, but even after experience has inform'd us of their constant conjunction, 'tis impossible for us to satisfy ourselves by our reason, why we shou'd extend that experience beyond those particular instances, which have fallen under our observation. (Hume, 1896: 91)

No one to our knowledge has devised any logical (hence, "reasonable") principle which permits us to move from the observation of a set of particular events to the assertion of a general law under which the set of particular events can be subsumed. The best that has been done, and it was done by Hume, is the claim that this "leap" from the particular to the general is simply a fact of human psychology, without any necessary "rationality" to it whatsoever.

Still, induction as a method remains widely accepted. Whether explicitly expressed or implicitly assumed, inductive reasoning forms the basis for much of the discussion on the nature of scientific

investigation. Kneale (1955) and Bergmann (1955), for example, discuss scientific investigation with the understanding that the principles of induction are already widely accepted. Donald Davidson comments that "induction is ... certainly a good way to learn the truth of a law." (1968: 57) And Max Weber permits a "causal relationship" to be regarded as a "law" "... if we have shown it to be universally valid by means of comprehensive historical induction" (1968: 85-86) In a textbook introducing social science methodology, one finds the authors claiming that induction "is the basis of scientific theory." Even though they admit that "we have made a logical leap from what we have seen to a prediction about what we have not seen", they justify this on the grounds that "We all use induction in our daily lives." (Manheim and Rich, 1981: 18)

But there are no compelling "reasons" to make the leap -- it is not "logical" at all -- and we remain somehow unsatisfied. The usual justification advanced for making such a leap is that it is "all we can do" or that it is somehow simply a miracle of human psychology. Newton calls the method "the best way of arguing which the nature of things admits of", and another recent introductory text makes the same point:

What is the justification for making such an inductive leap? The goal of scientific research is not to develop an understanding of one sample or one point in time. The goal is to understand general patterns in the empirical world. The only way we can develop such a general understanding is to gather evidence, one piece at a time. There is no other way for us to learn about the empirical world around us than by observation, and we can never observe everything simultaneously. (Kweit and Kweit, 1981: 23)

Hume reaches a similar conclusion: human beings simply induce, and not much more can be said about it. The problem is that such a conclusion appears to remove any rational basis for constructing general laws. This problem led Hume into a type of skepticism, but it can lead to much worse. For with the rational basis for the establishment of general laws removed, there is no particular reason to get excited about the ability to derive specific statements from them. Science, apart from its minor deductive capabilities, becomes essentially an irrational or extrarational pursuit, and knowledge remains rationally unjustifiable. It would seem then that the only thing to which we could refer would be pure personal preference, there being no impersonal reason to prefer one belief over another. The relativistic consequences of such a stand are certainly less than delightful.

Induction and Probability

There remains one sort of justification for induction. This is the idea that while we cannot draw certain conclusions from any number of specific observations, we may still speak of these conclusions as being more or less probable. Carl Hempel calls this type of induction "explanation by inductive subsumption under statistical laws". (1968: 184) These laws do not make the conclusion necessary, and therefore arguments based upon them are not of the strictly deductive type, but it is commonly claimed that we are nevertheless justified in accepting the conclusion upon probabilistic grounds.

But Hume has pointed out that resting knowledge on a criterion of probability is self-defeating. If all general laws can only be said to be probably true, then so is the general law which asserts this very thing, and the probability of the first general law is reduced proportionate to the probability of the "meta-law". But we can fashion a "meta-meta-law", of probable nature, which asserts this consequence, and we can continue to compound meta-law upon law until the probability of the original law is essentially reduced

to zero. (Hume, 1896: 180ff.) We are then right back where we started, seeking inductive justification for general laws of probability which will in turn justify general laws of science.

Hempel's approach requires some sort of principle of induction which would permit us to affirm or deny the conclusion of an argument based upon probability. The closest thing which we might have to a principle of induction which would permit affirmation of a conclusion is perhaps Carnap's "Theory of Confirmation" (Carnap, 1962), but we need to note that even Carnap's well-developed system does not permit us to formulate arguments and premises, as Salmon (1971) has shown. Hempel is left then only with the possibility of rejecting conclusions because of low probability, but this approach, too, suffers from a number of difficulties.

In the first place, as every student of statistics knows, we reject hypotheses on the basis of probability only when the probability that the observed relationship is due to random chance falls below an agreed upon critical level. The point is that no matter how high this level is set, it is set prior to the analysis of the observations, upon criteria which are methodologically arbitrary. The critical level is

never given to us as the result of our analysis of the data, but must instead be imposed upon it. In the absence of any theoretically relevant reason for selecting a critical level, we can have no logical basis, inductive or probable, for rejecting a statistical argument.

Accepting an hypothesis which is false is known in statistical circles as making a "Type II error". While our critical rejection can be set arbitrarily high (so long as it does not require us to reject everything) and thereby give us some "confidence" that we have not committed such an error, it is because of this very arbitrary nature that we are unable to insure ourselves against every Type II error. This may be a shame, but it is not the only problem. Statisticians also speak of a "Type I error" which is the opposite of the first: here we are making the mistake of rejecting an hypothesis which is actually true. Again, we can never be sure that we have avoided this error, no matter how low we set the critical value (discounting zero as a possibility). Most of our attention in statistics is directed towards minimizing the chances of a Type II error, while relatively little is done to protect against Type I.

If we keep in mind, however, that protecting

against one error necessarily means increasing the chances of making the other, (2) we see that Type I errors are problematic indeed. The general consensus is that, of the two, the Type II error is the worse, since it causes us more harm to believe in something that is wrong than to disbelieve something which is true. While this may or may not be the case, it is certainly the case that this attitude (which is simply Hempel's criterion) will leave unexplained, in principle, many events which occur with low probability. To take just one example, contemporary physical theory states that the decay of uranium may be due to bombardment of the atom's nucleus by alpha particles. But our observations tell us that when an alpha particle approaches the atom, there is a slight probability (on the order of $10 \exp -38$) that it will escape without striking the nucleus. This is an event of extremely low probability, but it does happen, and Hempel's model would leave us incapable of explaining such an event. (3)

There remains yet one view of the probability model which can potentially save it as a means of scientific explanation. This is the notion of "Statistics-as-Ignorance". It may be that there is a reason why our alpha particle escapes which we simply

do not know at this time. On this view of statistics, probability statements are regarded as conveying information. Information of which we are currently aware is expressed in the probability of the hypothesis being true, which we may designate as p . In a situation of perfect knowledge, $p = 1$, and perfect ignorance occurs when $p = 0$. Within the range of $0 < p < 1$, p represents our current knowledge of the situation, and $(1 - p)$ all the additional information which would be necessary for us to understand the situation perfectly. We may never have this knowledge, but the "statistics as ignorance" model asserts that this does not mean that such knowledge is ruled out in principle. A probability statement under this model, then, is an expression of the current state of scientific knowledge, and the probabilities can be expected to change as we modify hypotheses to reflect the changing state of our knowledge.

This approach fails to satisfy for two reasons, however. In the first place, such a model seems counterintuitive in light of the way probabilities are usually understood. When we say that the probability that a perfectly unbiased coin will turn up heads when flipped is exactly $1/2$, we are conveying all the information it is possible to know about that coin and

the circumstances of its being flipped. Indeed, we are speaking as if we had perfect knowledge of the situation. In another situation, with circumstances designed to bias the coin flip so that the probability of a head is $3/4$, we consider ourselves similarly informed. It seems improper to say that our knowledge of the situation has changed -- that we know more in the second case than in the first. Rather, what has changed is the situation itself. Similarly, should there occur an event of which we were never made aware, our inattention would not make the event impossible ($p=0$), for this would be an unacceptable solipsism.

Secondly, this approach suffers from a reliance upon determinism; that is, it implicitly asserts that the event in question has a cause, and that this cause can be considered as the explanation of the event. But an assumption of determinism is not necessarily warranted. Salmon (1971) notes that there is no argument in statistics which can be made to support or deny determinism. We may in fact be living in an indeterministic universe, and we have no right to decide a priori that we do not.

While his point is a good one, Salmon is apparently unaware that Popper has argued long and hard for the acknowledgement of an actually indeterministic

universe. A full exposition of Popper's argument will have to be deferred until we examine some subsidiary concepts upon which the argument is based. Let us just note here that if a successful argument for an indeterministic universe is established, the "Statistics-as-Ignorance" model cannot be upheld.

The Solution to Induction

Popper's answer to the problem of induction is simply to declare that it is no problem at all: it depends upon a misspecification of the way in which scientific and indeed all rational knowledge occurs. The point of attack to resolve the problem is not the establishment of principles of induction, but at the prior point of discovering how laws come to be formulated. We do not, according to Popper, formulate laws on the basis of past experiences; rather, we propose them as bold hypotheses and then provisionally accept them just to the extent that they do not conflict with experience. As part of establishing this method, he refers us to his "line of demarcation".

The Line of Demarcation

Coextensive with the problem of induction -- "Hume's Problem" -- is the problem of how to separate the "empirical" sciences from metaphysical speculation. If we remove induction from the tool chest of the empirical scientist, what characteristic is left to explain the difference between science and metaphysics, or between empirical science and mathematics or logic? The problem of discovering this characteristic difference is called by Popper the problem of "demarcation". These two problems, induction and demarcation, are "the source of nearly all the other problems of the theory of knowledge", and of the two, the problem of demarcation is the more fundamental. (Popper, 1968: 34) This is so since, generally speaking, induction has been used primarily as a means for establishing a basis for the empirical sciences which is independent of metaphysics. Dissolving the problem of induction then requires Popper to substitute something in its stead which would serve as an adequate delineator between the two fields of investigation. He accomplishes this demarcation by making two separate claims about scientific laws which, taken together, distinguish such laws from other types of statements,

such as metaphysical ones. They must be strictly universal and they must be falsifiable. Let us examine these criteria more closely.

The Nature of Scientific Statements

In Section 15 of The Logic of Scientific Discovery (1968), Popper discusses the distinction between strictly universal and strictly existential statements. A "strict" statement is one in which no proper names occur, and a strictly universal statement is a strict statement which includes universal quantifiers such as "all", "none", or "every", and excludes all so-called existential quantifiers such as "many", "some", "one", and so forth. A strictly universal statement contains only universal quantifiers and strictly universal concepts, while a singular statement contains at least one singular concept or existential quantifier. The negation of a strictly universal statement can always be expressed as a strictly existential statement, and the reverse is also true. The statement "What goes up must come down", which can be translated into the strictly universal statement "All things that go up must come down", can also be expressed in the statement "It is not the case that something goes up and does not

come down".

Popper's use of the term "universal statement" might cause some confusion here, until we realize that his notion of universality is something more than that which is employed in classical logic. This logic generally distinguishes universal, particular, and singular statements. The singular statement refers to one given individual, while particular and universal statements refer to elements of a class of individuals, the former referring to some of the elements of a class, and the latter referring to all of them. But this notion is not really what Popper means. The classical universal statement was not developed for reasons connected with the logic of knowledge, rather, it was developed "with an eye to the technique of inference." (Popper, 1968: 62, n.1) Classical universal statements remain bound to a particular place and time, while Popper's universal statement does not.

To see the difference, let us compare the following two statements: (a) light propagated in a vacuum travels at approximately 300,000,000 meters per second; (b) All of the Boston Celtics are over six feet tall. Classical logic, which is concerned only with the problem of proof and deduction treats these statements alike, but Popper wishes to distinguish

between the two. Statement (a) claims to be true regardless of space and time, while statement (b) refers only to a finite class of particular elements within a finite individual spatio-temporal region (Popper, 1968: 62). Statements like (b) can be replaced, at least in principle, with the conjunction of a finite number of singular statements. This is so because, given enough time, we could successfully enumerate all the elements of the class "Boston Celtics". And the truth of this conjunction of singular statements would be ascertainable by ascertaining the truth of each singular statement, and, using the rules of classical logic, determining whether their conjunction was true. The first statement, on the other hand, cannot be replaced by a conjunction of singular statements. It is making a claim about all places in the universe, and all times. The class of elements which this statement circumscribes, then, is infinite, and we cannot determine the truth of a conjunction of an infinite number of singular statements. This type of statement Popper calls a "strictly universal" statement, while the latter type, which claims to be true only of a finite class of events, Popper calls a "numerically universal" statement.

If one believes that natural laws are of the numerically universal form, then the problem of induction is no problem, for as we have seen, it is perfectly possible to go from the verification of strictly singular statements to the verification of their conjunction in the form of a numerically universal statement. But Popper maintains, that, to the contrary, natural laws are in fact expressed in the form of strictly universal statements, and here the move from the verification of singular statements to the verification of a natural law is clearly impossible. Even in the case of numerically universal natural laws, however, the problem of induction, while theoretically manageable, still presents insurmountable practical difficulties,

for the verification of a natural law could only be carried out by empirically ascertaining every single event to which the law might apply, and by finding that every such event actually conforms to the law --- clearly an impossible task. (4)

At any rate, the conjunction of a finite number of singular statements is always itself a singular statement. The difference between numerically universal and strictly universal statements is therefore a difference in kind, not just in degree. A

numerically universal statement can always be replaced by a strictly singular statement, but a strictly universal statement can only be replaced by the negation of a strictly singular or existential statement. Since the theories of natural science, and especially what we call natural laws, always have the logical form of strictly universal statements, they can be expressed in the form of negations of strictly existential statements, such as the "It is not the case" statement noted above. The law of conservation of energy, to use another example, can be expressed in the form "There is not a perpetual motion machine". In this formulation "we see that natural laws might be compared to 'proscriptions' or 'prohibitions'. They do not assert that something exists or is the case; they deny it." (Popper, 1968: 69). This form of expressing a natural law is one which Popper calls its "technological" form (Popper, 1964: 60ff.) and we will see that it is this form of social laws that Popper uses in his discussion of a "technological approach" to the solution of practical social problems.

Explanation, Prediction, and Falsification

What exactly shall we do with these "universal

statements"? Once we have them, how do we proceed to utilize them in a logic of scientific discovery? We do so through the use of predictions and explanations derived through simple deduction. Hempel (1965) distinguishes three basic types of scientific explanation: deductive-nomological, inductive-statistical, and deductive-statistical. The first of these models is often referred to as the "covering law" or the "deductive" model of scientific explanation (Dray, 1957). Hempel maintains that the latter two models of explanation also involve covering laws, and since two of the three involve deductive reasoning, wishes to single out the first type as the deductive-nomological model. As we have seen, he is willing to admit the possibility of statistical forms of explanation in science, and therefore finds it necessary to distinguish among these three models.

Popper, on the other hand, does not admit the possibility of a scientific explanation being couched in statistical terms. Statistical investigation in this sense turns out rather to be a form of inductive reasoning, which, although permitted by Hempel, is considered unsound and logically impossible by Popper. (5) For Hempel, the deductive-nomological model is only one mode of scientific explanation, while for Popper it

is the only mode of explanation. We will here, for the purposes of brevity, refer to this as the covering law model of explanation. (6) Popper describes how this model operates:

To give a causal explanation of an event means to deduce a statement which describes it, using as premises of the deduction one or more universal laws, together with certain singular statements, the initial conditions. (Popper, 1968: 59)

In his treatment of scientific explanation, Popper finds no need to adopt any "principle of causality". Indeed, the adoption of such a principle would be problematic for any investigation into scientific methodology. For the assertion that any event can be causally explained is either tautological or else an assertion about reality. In the first case, if "can" means that it is always logically possible to construct a covering law explaining an event, then the assertion is analytic and trivially true, and assertions of this type are not very valuable for the scientific investigator. On the other hand, if we wish to signify by the word "can" the notion that the world is governed by strict laws, this is a statement about reality, and is synthetic, but it is not falsifiable, as Popper shows in Section 78 of The Logic of Scientific Discovery. (7) Accordingly, he neither adopts nor

rejects any principle of causality, but instead relegates it to the realm of metaphysics, and excludes it from science. He does adopt a methodological rule which corresponds very closely to the principle of causality. This is the rule that "we are not to abandon the search for universal laws and for a coherent theoretical system, nor ever give up our attempts to explain causally any kind of event we can describe." (Popper, 1968: 61)

Now Popper's use of the covering law model is deceptively simple. It is based upon the logical principle of modus tollens. Popper describes this principle in the following fashion:

Let P be a conclusion of a system T of statements which may consist of theories and initial conditions (for the sake of simplicity I will not distinguish between them). We may then symbolize the relation of derivability (analytical implication) of P from T by "T-->P" which may be read "P follows from T". Assume P to be false, which we may write " \sim P", to be read "not-P". Given the relation of deducibility, T-->P, and the assumption \sim P, we can then infer \sim T (read "not-T"); that is, we regard T as falsified. If we denote the conjunction (simultaneous assertion) of two statements by putting a point between the symbols standing for them, we may also write the falsifying inference thus: ((T-->P). \sim P)--> \sim T) or in words: "if P is derivable from T, and if P is false, then T also is false. (8)

We can replace the variables in this argument with any

terms whatsoever, without disturbing the logical consequences of the argument. If we replace them with terms which generate true premises in the argument, then the conclusion must also be true. But notice what it would mean for the conclusion of a argument like this to be true. If $\sim T$ is true, then T is false. If we replace the statement " $T \rightarrow P$ " with a strictly universal statement, then the conclusion generated by such a form of argument can only be that the universal statement is false. Thus, for Popper, we do not concern ourselves with the verification of strictly universal statements (covering laws), only with their falsification.

An explanation of an event and its prediction can be treated in the same manner, and can be expressed in exactly the same form. Given covering laws, and given the singular statements of the initial conditions, we deduce a singular statement as a conclusion (the negation of a universal statement). Depending on our perspective, we are entitled to regard this deduction as either an explanation of the event, or as its prediction. Generally speaking, we make this distinction simply on the basis of a particular problem with which we are concerned. If the event has already occurred and we wish to know why, the covering law

model explains it. If we are given a covering law and specific initial conditions, and we wish to ascertain what can be expected from them, the event in question is said to be predicted. But again, it is important to note that for Popper there is no essential difference between prediction and explanation in science.

Popper's use of the principle of modus tollens is based upon a fundamental asymmetry between the logical handling of truth and falsity. It is a well-known logical principle that truth is transmitted downward in a validly constructed argument, i.e., from premise to conclusion, while falsity is transmitted upwards, from conclusion to premise. False premises will not necessarily generate false conclusions, nor will true conclusions necessarily entail true premises. (9) But since both false premises and true ones can generate true conclusions, we can conclude nothing about the truth of a premise from the truth of a conclusion based upon that premise. This is important, for it means that a universal law cannot logically be considered verified just because we may be able to use it in the explanation or prediction of an actual event. Even if we observe the event, and hold the statement of our observation to be true, it is possible to construct an infinite number of general laws from which this

observation can be derived.

This fact is analogous to the famous "Paradox of the Raven", which Quine (1975) attributes to Carl Hempel. The universal statement "All ravens are black" cannot be verified by any number of observations. This is so because the statement is logically equivalent to the statement "All non-black things are non-ravens". Since my refrigerator is non-black and at the same time a non-raven, the observation of this fact must be considered a verifying instance of this law, and of its logically equivalent form "All ravens are black". Indeed, there are an infinite number of non-black things in the universe, and therefore an infinite number of potential verifiers of the statement "All ravens are black". Yet it hardly seems proper to speak of such things as refrigerators when investigating a law about ravens. The attempt to verify a general statement leads us therefore into a type of paradox. Falsification, on the other hand, poses no such problem. Either of the two forms of the universal statement is falsified upon discovery of just one instance of a non-black raven, which would coincidentally be a non-black thing which is not a non-raven.

Popper has then shown us a way out of the twin

problems of induction and verification, by presenting a view of scientific progress which does not rely upon induction at all. Rather than induce universal laws and attempt to verify them through further observation, we need only propose them (out of thin air, as it were) and attempt to derive singular statements from them, the truth of which can be tested. If these singular statements prove to coincide with our observations, the hypothesis of the general law is said to be temporarily corroborated. We cannot, of course, conclude that it is true. If the singular statement is shown to be false by our observations, then this falsity is transmitted upward to the premise, and the hypothesis has been falsified. It is now up to science to discard the discredited hypothesis and replace it with a new one which will not generate the same false singular statement. (10)

In order for Popper's scheme to work, the original universal statement must at least in principle be falsifiable. That is, we must be able to derive from it certain singular statements which may be tested against empirical observations. This then becomes Popper's criterion for demarcation: if a statement is not falsifiable, it is not a scientific statement; rather, it is a "metaphysical" one. To see the

difference, compare the statement "The path of light is bent by the force of gravity" with the statement "All human beings are mortal". From the former we can derive a prediction which tells us that light from a star on the other side of the Sun should be bent around the Sun, causing us to observe an apparent deflection in the star's position. This statement can be checked against empirical observations, and, if false, would falsify the original hypothesis. But the second statement cannot be falsified, for we can conceive of no critical experiment which would enable us to observe an immortal human being. (11) Thus, this statement is for Popper a metaphysical one.

Note that Popper does believe with the positivists that metaphysical statements are meaningless --- meaning as such does not enter into his demarcation criterion. Metaphysical statements may yet be true or false, but they are simply not scientific, and their truth cannot be decided in a scientific manner. Nor does Popper believe that metaphysical statements are not useful or even necessary. He notes that

... it cannot be denied that along with metaphysical ideas which have obstructed the advance of science there have been others --- such as speculative atomism --- which have aided it. And looking at the matter from the psychological angle, I am inclined to think that scientific discovery is impossible

without faith in ideas which are of a purely speculative kind, and sometimes even quite hazy; a faith which is completely unwarranted from the point of view of science, and which, to that extent, is "metaphysical". (Popper, 1968: 38)

Problems With the Line of Demarcation

There exist some telling problems with Popper's criterion for science, however. One of these has been pointed out several times, notably by Skagestad (1975) and Lakatos (1974). Skagestad notes that Popper, in his Logik, has developed both a "thesis of falsifiability" and a "thesis of fallibility". This latter thesis relates to the point which Popper makes that his methodology only deals with the logical relationships among statements, and not with the actual truth-values of the statements themselves. We cannot, using Popper's method, ever be certain of constructing sound arguments, only valid ones. (12) Logical proof is always something less than truth; thus logic cannot tell us anything about the truth of the premises involved in the argument itself.

Popper himself partially realizes this problem when he notes:

In point of fact, no conclusive disproof of a theory can ever be produced; for it is always possible to say that the experimental results are not reliable, or that the discrepancies which are asserted to exist between the experimental results and the theory are only apparent and that they will disappear with the advance of our understanding If you insist on strict proof (or strict disproof) in the empirical sciences, you will never benefit from experience, and never learn from it how wrong you are. (Popper, 1968: 50)

We can, in other words, always invent ad hoc hypotheses to explain away the observed discrepancy between theory and experimental results, and thereby refuse to falsify the theory. We are not prevented from doing this by any rule of logic, and so Popper must instead rely on the good will of the well-meaning scientist to eliminate ad hoc hypotheses from his program.

Popper is making the point that not only is the general law which we are testing falsifiable, but so are our observational statements which we are using to test the law. Indeed, he often regards all statements, even those referring to singular observations, as hypotheses (Cf. Popper and Eccles, 1977). Why are we not entitled to regard the singular statement referring to our observation as false, rather than our universal law? In fact, it often seems that most of what scientists do involves rejecting experimental

observations which do not seem to coincide with some prediction generated by a covering law. The logic of Popper's method in no way forces us to regard the prediction generated by his method as false simply because it conflicts with what we have apparently observed. We are only presented with two contradictory singular statements, both of which cannot be true, but Popper's method does not, and can never, give us a rule for deciding between them. In other words, all statements are fallible, and, as Ayer expresses it, "Logically, our freedom is unlimited". (cited in Skagestad, 1975: 26, my emphasis)

Furthermore, the notion that all statements are fallible applies equally well to the "initial conditions" which Popper includes in his covering law model of explanation. Using that model and modus tollens, he constructs an argument of the following type:

Let "T" be a universal law, and "P" be a prediction derivable from this law. Then the argument from modus tollens seems to run thusly:

$T \rightarrow P$

$\sim P$

$\sim T$

And the universal law is apparently falsified. But remember that Popper says that the general law does not by itself generate the prediction. Rather, it must be accompanied by certain statements which describe the "initial conditions". A law such as "Water at sea level boils at 100C" does not directly produce the prediction "The water in this container will boil". It must be accompanied by at least two more statements of initial conditions: "The water in this container is at sea level", and "The water in this container has been heated to 100C". Thus, the argument does not really proceed in the manner of the simple modus tollens described above. Let the first of our statements of initial conditions be designated as "S1" and the second as "S2". Since the general law must be taken in conjunction with the initial conditions to yield the prediction, we must replace the simple conditional of the above argument with the statement: " $(T.S1.S2) \rightarrow P$ ". Now, however, from an observation of the form " $\sim P$ ", we are entitled to conclude only " $\sim(T.S1.S2)$ ", or, in other words, " $(\sim T \vee \sim S1 \vee \sim S2)$ ". (13) Popper's

method does not tell us which of the elements of this statement must be considered to be falsified.

It may be objected on Popper's behalf that all we need to do to find out which of the three premises has been falsified is to examine them individually, particularly the initial conditions. If these prove to be true, then we now have an extended modus tollens which tells us that the general law is indeed false. Indeed, we could do the same thing to overcome the previous objection: merely test the observation to see if it is true, and thereby decide the truth of the prediction. Certainly this is what scientists do all the time. But the point here is that this testing cannot be carried out within Popper's system without leading to an infinite regress of undecidability. We may propose to test statement S2 for example, by creating the following new conditional: "(S2.S2') ---> S2'" where "S2'" stands for "Mercury in this glass rises to this mark at 100C", and "S2'" stands for "The mercury in this glass when inserted in this water rises to this mark". But we have merely replaced the problem of the old initial conditions with the problem of the new initial conditions. In fact, the initial conditions themselves can be seen to be predictions based upon different covering laws which are also

falsifiable, and we can extend the premises of this argument indefinitely.

Finally, another related problem is one which to my knowledge has never been pointed out before, and this occurs when we apply the criterion of demarcation (a methodological rule) to itself. We may legitimately ask the question whether Popper's rule of demarcation is itself a scientific law or whether it belongs to the realm of metaphysics. If the statement "All scientific laws are falsifiable" is itself a scientific statement, then it must in some way be capable of being falsified. The rule must be regarded as an hypothesis, and we must be able to fashion a test for this hypothesis, according to the rule of demarcation. But since this rule is itself the hypothesis to be tested, the action of the last sentence, viz., "we must be able to fashion a test for this hypothesis" becomes in its turn an hypothesis, and is therefore testable. As is the last statement, and so on, ad infinitum. Therefore, if the idea that scientific statements are those which are testable is itself a scientific idea, we are led to the paradox of not being capable of testing a testable hypothesis.

If, on the other hand, there can be no falsifying experience for Popper's line of demarcation (as I

believe is the case), then Popper's rule of demarcation seems to be a metaphysical construct, not an empirical one, and must compete for acceptance in the world of metaphysical propositions. But Popper has shorn it of its ability to do so: he does not believe that there can be a standard or criterion for deciding among metaphysical ideas. Indeed, this is the very heart and purpose of his rule of demarcation.

In brief, we can sum up the problems with Popper's method of demarcation as follows:

1. We do not know, from Popper's method alone, whether we have shown the prediction to be false, and therefore falsified the hypothesis.

2. Even if we are convinced that the prediction is false, we cannot conclude that the hypothesis is necessarily false in the presence of other initial conditions which were necessary to derive the prediction.

3. We cannot falsify the line of demarcation itself, indicating that it is not a scientific statement, yet Popper maintains that metaphysical statements are undecidable.

Conventionalism

Popper recognizes the first two problems, and attempts to rescue his method from criticism by using what Skagestad calls Popper's "thesis of conventionalism". Simply put, Popper takes the line that the only way out of the bind into which his notion

of method leads him is to treat the method as if it were composed of rules for a "game", and to require that scientists agree to abide by these "conventions" before engaging in research. (Popper, 1968: 53) Accordingly, Popper suggests that we utilize a rule against the introduction of ad hoc hypotheses, for example, and agree to accept it prior to the initiation of scientific inquiry, just as the rule that chess pieces may only be moved in certain well-defined ways must be accepted by all players before the game begins. There is nothing intrinsic about the chess pieces which forces us to move them in any particular fashion, but if we change the pattern of allowable moves, we will simply not be playing chess. Similarly, we could adjust the rules of investigation to allow the use of ad hoc hypotheses, and this would be perfectly legitimate from a logical point of view, but Popper would maintain that we would not then be practicing science, but something else instead. Changing the rules of chess might result in a different, even enjoyable, game, and there may be other useful and proper forms of investigation, but both of these "mutations" must nevertheless be distinguished from the original "games".

There are other examples of methodological rules

of the game of science which must be regarded as conventions. Popper gives us two:

(1) The game of science is, in principle, without end. He who decides one day that scientific statements do not call for any further test, and that they can be regarded as finally verified, retires from the game.

(2) Once a hypothesis has been proposed and tested, and has proved its mettle, it may not be allowed to drop out without "good reason".

(14)

We must also develop conventions regarding the truth of initial conditions and of observation statements. These are basically the same, since we have seen that the initial conditions of one covering law explanation schema can themselves be regarded as singular statements derived from other covering laws. We develop this convention by first accepting a prior convention, one of "intersubjective testability". This convention states that we will agree to accept observation statements which somehow seem independent of any particular observer. Since there can be no rule telling us when enough intersubjective testing of observations has been done, we can only rely upon some general consensus on the part of the observers.

Incompleteness in Science

At first glance, Popper's reliance on conventionalism as an escape from criticism might seem to be an ad hoc hypothesis of his own, and a defect in his program. In one sense, it is a defect, or rather the result of a defect, but it is not a problem limited to Popper's system. Instead, it is a problem endemic to systems of science in general. A hint of what this problem is can be seen when Popper tells us:

Although logic may perhaps set up criteria for deciding whether a statement is testable, it certainly is not concerned with the question whether anyone exerts himself to test it. (Popper, 1968: 54)

There are "holes", in other words, in scientific practice which logic does not fill. It cannot define for us an interesting problem, it cannot motivate us to undertake research, and it cannot force itself on us and require us to behave logically. Most importantly, perhaps, logic cannot by itself establish the truth or falsity of any single observation statement, or of all statements derivable from other statements. This may seem somewhat paradoxical, but it is one of the more fascinating and far-reaching findings in mathematical logic.

In his now-famous 1931 paper, "On Formally Undecidable Propositions of Principia Mathematica and Related Systems", the Austrian mathematician Kurt Godel has shown that in any logical system powerful enough to contain number theory, we must expect either inconsistency or incompleteness. That is to say, either we will have a system in which there appear contradictory propositions, or, if we avoid this, one in which certain well-formed formulae (wff) or propositions will not be "decidable" as to their truth or falsity. (15) They cannot be proved or disproved by the system. In the fields of mathematics and logic, this paper has had broad and important impact, but the full ramifications of Godel's finding have not yet been widely recognized. It can be shown that the findings are generalizable to include scientific investigation. If we view science as a systematic method containing formal rules for investigation (whether these rules be inductive or deductive in character) and note that it utilizes mathematics and logical principles, science too must be content with either inconsistency or incompleteness.

Of the two, inconsistency is the worse problem, for it can be shown that inconsistent premises logically entail all possible statements. Such a

system would fail to distinguish between true statements and false ones, precisely what science is supposed to be able to do. (16) If we do not wish our science to generate conclusions indiscriminately, and to be unable to distinguish between truth and falsity, we must instead be satisfied with incompleteness. That is, there must remain some well-formed statements of science the truth or falsity of which cannot, in principle, be determined by science. This has grave consequences for a philosophy of science, of course, and one of these is the consequence that scientific proof must always remain something less than truth. To put the matter more simply, the old idea of science as a means for dividing all statements about empirical reality into distinct classes of true and false statements has been shown by Godel's work to be an impossible program. Any science which could decide the truth or falsity of all its propositions would have to be too "weak" (17) to be of any use, or in some fundamental sense, inconsistent. If we desire a science of sufficient strength which is at the same time consistent, we must expect that there will be some propositions whose truth or falsity cannot be determined. That is, we will have to appeal outside our system of science for such a determination to be

made.

This problem is characteristic of all formal systems, and hence of all scientific systems, not just the one which Popper has devised. The important point in all this is that methodological rules cannot justify themselves. We must appeal to some criterion outside the system which operates at a "higher level" than the system itself, if we are to find justification for such rules. Popper's conventionalism is his mode of appeal; it is his way of deciding certain propositions by getting outside the boundaries of science.

The Problem with Conventionalism

Having made this brief excursus into the general problem of incompleteness, let us return to Popper's conventionalism. Now we have seen that the rule of intersubjective testability is a convention which we are to adopt in order for us to formulate conventions regarding the acceptance of observation statements (or basic statements in general). This shows that there are not only low-level conventions, "rules of the game", but also higher and higher levels of conventions, each one an agreement to accept a lower level. Indeed, there is one great convention which

Popper regards as requiring acceptance prior to the designation of any subsidiary rules. In designing the game of science, we first of all set down a "supreme rule"

... which serves as a kind of norm for deciding upon the remaining rules, and which is thus a rule of a higher type. It is the rule which says that the other rules of scientific procedure must be designed in such a way that they do not protect any statement in science against falsification. (Popper, 1968: 54)

This rule is really just a translation of the criterion of demarcation, for any violation of the rule would amount to treating some scientific statement as unfalsifiable (and therefore "metaphysical").

But we have touched on a problem in all this: even this so-called "supreme rule" does not carry its own justification, and must be regarded as a convention. There must still therefore be some higher level of agreement to accept this rule, and it is therefore not truly "supreme". In fact, the requirement of agreement extends to indefinitely higher levels, and there can be no supreme convention at all. How can this seemingly hopeless chain of conventions ever be limited to give meaning to the practice of science? In short, why should we "agree" to accept Popper's own doctrine of conventionalism?

Problem Situations and Traditions

This latter question basically asks for a way of deciding among methodologies, and Popper of course attempts to answer it. And just as the justification for his methodological system could be accomplished only by stepping out of this system into the higher level "system" of conventionalism, so does his justification of this latter system require another, higher-level appeal to his "system" of "problem situations".

Let us look at this notion by examining some of the ideas expressed in Popper's 1949 essay "Towards a Rational Theory of Tradition" (Popper, 1962: 120-135). The essay as a whole is concerned with the role which tradition must play in scientific investigation. If we take "tradition" to stand for certain commonly inherited sets of problems, hypotheses, and myths, as Popper does, then we shall see that Popper is directly addressing our question regarding methodologies.

At one point in the essay, Popper invites us to consider what advice we should give a student aspiring to be a scientist, and tells us that this advice cannot simply be "Go round and observe". (Popper, 1962: 129)

This must be so because the command to observe does not carry with it a qualifier telling the student what to observe. If I am told, for example, to write down what I am now observing, I can hardly think where to begin. Should I write that I am shut in a very hot, stuffy office? That my pen skips? That my shoes are badly in need of repair? Or should I begin listing the contents of my desk top? Perhaps I should concentrate instead on my feelings about these more immediate observations, or perhaps I should record the fact that I am aware that I can list thousands of observations which I am capable of making at any moment.

The point is that the number of possible observations is infinite and, more importantly, at this time I consider nearly all of them to be irrelevant. This leads me naturally to consider relevance as a potential way of filtering the number of possible observations to arrive at a much smaller and more manageable set of relevant observations which I can then regard critically according to some methodology. Now Popper maintains that the criterion for relevance of an observation is that it have some recognizable connection to some problem with which we are concerned. If my problem is writing a dissertation (and it is), then the observation that my pen is running out of ink

is a relevant one, and its relevance is almost immediately apparent. Observing the state of my footgear, on the other hand, is not generally understood to have such relevance, although in this case it proved to be relevant in that I realized (a further observation) that I could use that observation as an example in the preceding paragraph. This shows that a potential observation's relevance in one context may or may not be immediately recognized, even though it is known to be relevant in another context (such as the problem of acquiring a decent wardrobe on an Instructor's salary).

At any rate, the relevance of an observation is directly related to the "problem situation" in which the observing agent is placed. For scientists, this problem situation is especially composed of traditions, rules, hypotheses, and critical problems of science. Accordingly, Popper advises his young student to do more than observe. He tells him instead:

... you should study the problem situation of the day. This means that you pick up, and try to continue, a line of inquiry which has the whole background of the earlier development of science behind it; you fall in with the tradition of science. (Popper, 1968: 129)

And in so doing, you study history.

Studying this tradition gets the ball rolling for the neophyte. But we might ask how the traditions themselves got started. How, in other words, did the first scientist choose his criteria for observation? The answer should be obvious: by essentially the same method of attempting to understand and resolve some problem situation. While the newly-inducted student of science may find himself asked to consider the problem "Why has the Sun apparently stopped producing neutrinos?", (18) the hypothetically first scientist may have begun by considering the problem of why he got so hot standing under that big ball of fire in the sky.

These problem situations not only filter our observations, (19) but also define the context in which methodologies may be judged. We have seen that Popper cannot justify his system logically, and must appeal to agreement. Yet he cannot compel such agreement using "scientific" arguments, and is reluctant to rely upon metaphysical arguments. But by noting that problem situations are the impelling force in our investigations, providing purpose and filtering observations, he is able to claim that those techniques which we select should be those which result in the solution (or at least a better understanding) of our problems.

Thus a methodology is to be judged after it has been utilized. The proof of the pudding will be in the eating. If a methodology serves to make clearer something which was unclear, or enables us to overcome the problem which impelled our investigation, it is a good one. If not, it is a bad one. Popper can then finally present us with an argument for the acceptance of his own methodology, in particular his line of demarcation:

My only reason for proposing my criterion of demarcation is that it is fruitful; that a great many points can be clarified and explained with its help It is only from the consequences of my definition of empirical science, and from the methodological decisions which depend upon this definition, that the scientist will be able to see how far it conforms to his intuitive idea of the goal of his endeavors. (Popper, 1968: 55)

This new "criterion of the problem situation" is at the heart of Popper's original critique of historicism. For in his early work, he is primarily concerned with criticizing historicism as a poor method -- one which does not yield fruitful results in terms of enabling us to deal with some problem situation. Moreover, its "poverty" is seen in light of its own recognized problem situation. That is, even if we accept that the problems with which historicists are

concerned are the fundamental problems of history and political science, the method falls short. Historicism does not do what it claims to do.

Further problems need to be worked out regarding Popper's methodology, but it would be useful now to turn to Popper's early critique of historicism. The analysis of this critique will then lead quite naturally back to a yet unexamined problem -- the cultural and historical relativism inherent in relying upon problem situations and traditions.

(1) See for example Byerly, 1973: 394-395. Not all logicians agree with such a distinction, however. Howard Kahane, for example, maintains that "there isn't any truth to this old idea about the difference between deductive and inductive reasoning." (1980: 6) He bases his argument upon examples which purport to show "valid" arguments which move from particular premises to particular or general conclusions. The problem here, though, is in his notion of a "valid" argument -- one in which if the premise were true "then that would be a good reason to accept the conclusion." (Kahane, 1980: 6, n.4)

Unfortunately, it is the very idea of what constitutes a "good enough reason" for accepting a conclusion that is at stake here, and Kahane's informal approach is of no help to us. We will therefore maintain the traditional, formal distinction.

(2) This is due to the fact that the probability of an event occurring combined with the probability of it not occurring must equal unity.

(3) This type of problem in explaining low probability events is often used on me by my fundamentalist friends. Believing with Hempel that scientific laws are inductive in nature, and that they therefore deal with events of high probability, they challenge the scientific thesis of evolution by pointing out to me that, by the scientists' own admission, the probability that evolution would produce human beings just as they are is vanishingly small, and that science has therefore shown the very improbability of evolution, rather than established it as fact. I hope the following treatment of scientific explanation provides a response to such an argument.

(4) (Popper, 1968: 63) Popper believes that "the question whether the laws of science are strictly or numerically universal cannot be settled by argument. It is one of those questions which can be settled only by an agreement or a convention." (Popper, 1968: 63) And since the problem of induction does not go away in practice, even with the consideration of natural laws as numerically universal statements, Popper concludes that it is more useful and fruitful to deal with natural laws in their strictly universal form. We will return to this notion of "conventionalism" later.

(5) Note, however, that this does not prevent Popper from outlining his own "frequency theory" of statistical analysis and using the results to interpret certain statistical statements as attempts to falsify general laws. See Berheide (1981) for an examination of this theory.

(6) This model is sometimes referred to as the "Popper-Hempel" model of explanation. (Cf. Wilkins, 1976) I believe this reference to be a mistake, for it ignores wide differences in the way in which general laws are treated by the two thinkers.

(7) Popper asks, "Is the world ruled by strict laws or not? This question I regard as metaphysical. The laws we find are always hypotheses; which means that they may always be superceded, and that they may possibly be deduced from probability estimates. Yet denying causality would be the same as attempting to persuade the theorist to give up his search; and that such an attempt cannot be backed by anything like a proof has just been shown." (Popper, 1968: 247-248) Popper is alluding to his argument earlier in the work (Cf. Section 69, "Law and Chance") that the results of scientific experimentation can never be used to support either a deterministic or an indeterministic position.

(8) (Popper, 1968: 76) The special symbols which Popper uses are slightly different than the ones contained here in the text, but the vagaries of the Berea College computer system make improvisation a virtue here.

(9) The section below on incompleteness will further make this point in asserting that from contradictory premises, which necessarily contain falsehood, any conclusion whatsoever can be drawn, including statements which are true.

(10) There is slightly more to it than this, of course. An hypothesis which is discredited by one observation has been falsified, but we will not simply discard it in favor of any hypothesis which is not discredited by the same observation, for there are an infinite number of these. We instead must develop an hypothesis which has at least the same "explanatory power" as the first and which in addition is not falsified by the same observation. Such an hypothesis may not be put forth for some time, and we may be

forced to limp along for awhile with the knowledge that our theories are false. Popper discusses this problem as the problem of "verisimilitude". (Cf. Popper, 1979: Chap. 2).

(11) Anytime we claimed to observe such a phenomenon, we might justly be asked to "wait just a little while" for the observed subject to die. This constraint could be pushed indefinitely into the future. Indeed, the subject might outlive many generations of experimenters, with no change in the possibility that the subject might yet be mortal. We might attempt to get around this by waiting until all human beings were gone from the face of the Earth, but who then would be making the observation? Note, however, that while the statement "All humans are mortal" is not falsifiable (and is therefore "metaphysical") its counterpart, viz., "All human beings are immortal" is falsifiable, and is in fact falsified every few seconds.

(12) The traditional distinction between a sound argument and a valid argument is that in a valid argument, if the premises are true, then the conclusion must be true. A sound argument is a valid argument in which the premises are in fact true.

(13) The character "v" here stands for logical disjunction. Read it as the word "or".

(14) (Popper, 1968: 53-54) He continues here: "A 'good reason' may be, for instance: replacement of the hypothesis by another which is better testable; or the falsification of one of the consequences of the hypothesis."

(15) Technically, the incompleteness does not apply to the truth of statements, only to their derivability within some formal system. However, such systems are generally constructed so as to be isomorphic to real truth and falsity. That is, derivable statements within the system are meant to correspond to true statements about reality, and non-derivable ones to false statements. So a wff which is undecidable within some system corresponds to some statement about reality whose truth or falsity cannot be determined.

(16) The assertion that from contradictory

premises any conclusion whatsoever can be drawn is easily shown. Let P be a premise and $\sim P$ be a contradictory premise. Now it is universally valid that

$$P \rightarrow (P \vee Q); \text{ (read "If } P, \text{ then } P \text{ or } Q\text{")}$$

If we substitute " $\sim P$ " for " P ", we have

$$\sim P \rightarrow (\sim P \vee Q)$$

Using the principle that $(A \vee B) \leftrightarrow (\sim A \rightarrow B)$, we can write

$$\sim P \rightarrow (\sim \sim P \rightarrow Q)$$

Simplifying:

$$\sim P \rightarrow (P \rightarrow Q)$$

Which yields, by the principle of importation:

$$(\sim P \cdot P) \rightarrow Q; \text{ (read "If not } P \text{ and } P, \text{ then } Q\text{")}$$

Thus the assertion of the truth of the conjunction of two inconsistent premises yields any conclusion whatsoever.

(17) The power of a formal system is related by logicians to the ability of that system to incorporate the principles of arithmetic. The more propositions of arithmetic (or number theory) which can be expressed by a formal system, the more powerful that system is. For Godel, a "sufficiently powerful" system is one which can express all number theoretical statements expressible in Peano arithmetic. Obviously, our science should be sufficiently powerful, if it is to make use of arithmetic.

(18) The range of this problem is explored in an interesting article by James S. Trefil in the March, 1978 issue of Smithsonian Magazine.

(19) Popper claims indeed that they act in an even more fundamental way than as filters. He believes it impossible to observe anything at all without some problem in the background. That is, in the absence of any problems, we would simply not observe. That this

does not occur is due to the fact that problem recognition is built into us at the biological level -- to be alive is to experience problems -- and is not something we can choose to do without. See esp. Popper and Eccles, 1977.

III. HISTORICISM

Truth is with the victor -- who, as you
know, also controls the historians.
-- Hochhuth, The Deputy

We have begun the investigation of this topic with an examination of the thought of Sir Karl Popper, for at least two reasons, one of which is immediately apparent, and one of which will become sensible only after the investigation is complete. This latter reason, briefly, requires an understanding of the taxonomy of critiques which this work will develop. We may place Popper at the beginning of the investigation because his thought (at least as expressed in his earlier work) may be classed as belonging in the simplest and least comprehensive class of criticism with which we will be dealing. Further discussion of this will have to be deferred.

The more immediately apparent reason is that thus far in our discussion we have not yet had occasion to admit a definition of the term "historicism", and Popper provides us with one. Indeed, if he does not actually claim to have coined the term, he at least feels responsible for dragging it into the limelight and attaching to it his own definition. (Popper, 1964: 3) His understanding of the term is broad, (1) as we

shall see, but limited to a clearly discernable core set of principles, which will serve adequately throughout this work. It is perhaps best to start with that work of Popper's which is most forthrightly directed towards our topic: The Poverty of Historicism (1964), by his own admission his "stodgiest piece of writing". (Popper, 1976: 114) Here we may find Popper's clearest and leanest definition of "historicism":

What I mean by 'historicism' will be explained at length in this study. It will be enough if I say here that I mean by 'historicism' an approach to the social sciences which assumes that historical prediction is their principal aim, and which assumes that this aim is attainable by discovering the 'rhythms' or the 'patterns', the 'laws' or the 'trends' that underlie the evolution of history. (1964: 3)

Prediction or explanation is the primary goal of the scientific enterprise, according to Popper, and we have seen that this goal is met through the construction of his covering law model. Although his model was developed with the natural sciences as his primary consideration, Popper nowhere denies the possibility of practicing social science according to the same principles. To be sure, we will note some differences which Popper sees between the two branches

of science, primarily in the differing constraints placed on experimental method by the different subject matters, but the basic methodology is the same in either case. To the extent that the historicist makes this claim, Popper is in agreement.

The difference between the historicist outlook and that of Popper basically concerns the nature of the covering laws which may legitimately be used, and the content of the predictions or explanations which can be generated by the model. For the historicist, covering laws in social science will be about history, and the specific predictions derived from them will be historical in nature. For Popper, we shall see that covering laws cannot have any historical character and still remain strictly universal statements, and therefore predictions cannot be historical either.

This definition of historicism, and Popper's critique of that view, have been criticized by Marcuse (1957) on the grounds that Popper does not deal with any actual thinkers; that he in effect sets up a straw man historicism and beats it to death. This proves no point whatsoever, Marcuse claims, since no one in his right mind would believe all the things which Popper imputes to his imaginary historicist. (Marcuse, 1957: 121-122)

But at least three objections can be raised to this. For one thing, we shall see that Popper does deal very specifically with particular thinkers in The Poverty of Historicism, notably Karl Mannheim, Bertrand Russell, and Karl Marx, and in addition he also manages to sideswipe Plato and Aristotle. Secondly, by the time Marcuse had written his review, he certainly had available Popper's The Open Society and Its Enemies (1966), originally published in 1942. This work deals extensively with Plato, Aristotle, Marx, and Hegel, who Popper argues are historicists supreme. A third objection is that Popper never set out to critique one particular writer, or any five or six people that he could lump together as historicists anyhow. In the opening pages of The Poverty of Historicism, Popper sets forth his method of dealing with historicism, and that is to make as strong a case as possible for the historicist:

... I have not hesitated to construct arguments in its support which have never, to my knowledge, been brought forward by historicists themselves. I hope that, in this way, I have succeeded in building up a position really worth attacking. In other words, I have tried to perfect a theory which has often been put forward, but perhaps never in a fully developed form. This is why I have deliberately chosen the somewhat unfamiliar label "historicism". (Popper, 1964: 3)

His justification for doing this is to make as strong a case for historicism as possible. Presumably, if one can defeat the strongest case, one automatically defeats all lesser cases. Additionally, he says, by introducing this term,

I hope I shall avoid merely verbal quibbles: for nobody, I hope, will be tempted to question whether any of the arguments here discussed really or properly or essentially belong to historicism, or what the word "historicism" really or properly or essentially means. (1964: 3-4)

Marcuse, however, either did not read this passage, or read it and chose to ignore it anyway.

In the Preface to The Poverty of Historicism, (2) Popper notes that in this work, he had not attempted to refute historicism, but merely to show that as a method of investigation it could not be very fruitful. He states that only after developing his ideas on indeterminism did he realize that historicism was not only a poor method of scientific investigation, but that it was also actually false. (Popper, 1964: vi-viii) We will deal with Popper's criticism of historicism in two parts, examining in the next chapter his early analysis of historicism as a poor (unscientific) method, and then investigating his

refutation.

The Claims of Historicism

Popper divides the supporters of historicism into two broad categories, according to their understanding of the demands of social science methodology. Those who would maintain that the methods of the natural sciences (with physics being the natural science par excellence) may be imported, with little or no modification, into the social sciences, he calls "pro-naturalistic" or "positive" historicists, and those who believe precisely the opposite, viz., that the methods of physics cannot be adapted for use by the social sciences, he terms "anti-naturalistic" or "negative" historicists. Note that one does not have to be an historicist to believe in either of these points of view. However, Popper maintains that in the context of the definition of historicism noted above, each doctrine becomes a fallacy, owing primarily to a distorted view of the natural sciences. We will turn to the anti-naturalistic fallacy first.

Anti-Naturalism

The basic anti-naturalistic tenet is that social laws necessarily depend upon particular historical situations, and are thus not like the laws of physics, which are presumed to be independent of time and place. Such historical relativism makes the methods of the natural sciences inappropriate for social science. (3) Methods which purport to find a constancy in human nature and history can really be nothing more than social apologetics, and the historicist

... opposes them by maintaining that social uniformities differ widely from those of the natural sciences. They change from one historical period to another, and human activity is the force that changes them. For social uniformities are not laws of nature, but man-made; and although they may be said to depend on human nature, they do so because human nature has the power to alter and, perhaps, to control them. Therefore things can be bettered or worsened; active reform need not be futile. (4)

A second objection to the importation of method arises over the importance of the use of experiments in the natural sciences. It is asserted by the anti-naturalist that this significant method is impossible to use in examining social questions, since the problems of controlling for extraneous variables

would preclude any real analysis. Experiments of a large enough scale to deal with social questions would really be political processes, and hence would not be repeatable, even in principle, since the initial conditions of the experiment would have been altered by the experiment itself. Finally, even if these first two objections could be met, the historicist could simply respond that all results of a properly executed social experiment would still be applicable only to a particular historical period or epoch, and could not be generalized to the level of a "law". This relates to another objection brought by these historicists, namely that all social experiences, like biological experiences, are novel, and are intrinsically "new". (Popper, 1964: 10) Because of this we will never be able to discover general laws of cause and effect in society. We may understand some causes, but they will never again have precisely the same effect.

Anti-naturalists also appeal to what Popper calls a "twofold complexity" in social phenomena. As noted, the problem of disentangling relevant variables and observations is one aspect of this complexity, which we might consider "horizontal complexity". There is also, however, a kind of "vertical complexity" in human affairs (5) such that an understanding of sociology

presupposes an understanding of psychology, which in turn presupposes an understanding of biology, and so on. Presumably, sociological knowledge would eventually presuppose (though perhaps not be reduced to) knowledge of physics. This mammoth complexity, while not ruling out understanding of social phenomena in principle, at least makes such understanding a practical impossibility. (Popper, 1964: 12)

To further complicate matters, social phenomena fall victim to what Popper calls the "Oedipus effect", after a well-known problem in Greek Tragedy. The problem has appeared before, generally under the rubric of "self-fulfilling" or "self-denying" prophecies. The idea here is that, owing to the fact that in studying social phenomena we are at the same time student and object of inquiry, certain predictions or discoveries will produce a situation in which it is impossible for the predicted event to take place:

Suppose, for instance, it were predicted that the price of shares would rise for three days and then fall. Plainly, everyone connected with the market would sell on the third day, causing a fall of prices on that day and falsifying the prediction. The idea, in short, of an exact and detailed calendar of social events is self-contradictory; and exact and detailed scientific social predictions are therefore impossible. (1964: 13-14)

Popper's presentation of the Oedipus effect as an argument used to support the anti-naturalistic position is particularly interesting, in that we will find later that his own more advanced arguments against historicism make use of a similar problem encountered when science turns its methods of inquiry upon itself. More specifically, we will see that the problem of indeterminism in science will be treated by Popper as final proof of the falsity of the historicist view.

The Oedipus effect, according to the anti-naturalists, must of necessity destroy the ability of the social scientist to maintain any form of scientific objectivity. The argument may first of all be made that the social situation of the scientist which precipitated the effect in the first place indicates that he cannot be considered merely an objective viewer of some system existing apart from himself. As a member of the social structure being studied --- whether it be a family, a political unit, or simply "mankind" --- he is himself the subject of his own investigation, and it is easy to see that this type of investigation cannot proceed "objectively."

(6) The theoretical problem here will often express itself practically, usually in the form of moral dilemmas presented to social scientists:

The interaction between the scientist's pronouncements and social life almost invariably creates situations in which we have not only to consider the truth of such pronouncements, but also their actual influence on future developments The very fact that his pronouncements do exert an influence destroys their objectivity. (Popper, 1964: 16)

The case of the financial analyst predicting the future trend of the stock market is a good case in point. Knowing what he knows, and knowing what the reaction to what he knows will be, what course of action should he take? The point is, say the anti-naturalists, social scientists must necessarily be faced with difficult moral dilemmas anytime they are investigating social phenomena which are in any way interesting. Their decisions, actions, predictions, and theories will then be subjective, and therefore unscientific. (7)

Besides the problem of researcher objectivity in social science, anti-naturalists point to an even deeper reason for the inappropriateness of natural science methodology in social science. In their view, says Popper, the objects of sociological analysis (i.e., social groups) are inherently different from objects of physical analysis, and methods developed to deal with the latter cannot be applied to the former. (Popper, 1964: 17-19) An interesting point regarding

methodologies may be raised here. The assertion that a particular method of investigation is the only one which can lead us to truth has already been seen to be patently false, when we applied Godel's Incompleteness Theorem to the problem of formalizing truth in science. Since methodology is always a matter of proof, and since Godel's theorem demonstrates that formal proof must always remain something less than truth, it follows that no one methodology can have a monopoly on the discovery of truth.

This much might easily be recognized by anyone. Indeed, Popper here makes the claim that the anti-naturalist historicists assert as much. But the assertion that this or that methodology is not useful in studying a particular object because of the nature of the object at least in part begs the question. If we wish to examine the nature of an object, it does us no good to choose our methodology on the basis of pre-existing ideas of what that nature is. As Popper has already shown, under such circumstances we must in effect regard methodologies as experiments themselves, trying them out and accepting or rejecting them according to their fruitfulness. There is no method by which we can take into account the nature of our object of inquiry and construct a foolproof methodology a

priori. Popper himself does not apply this specific criticism to the anti-naturalist viewpoint, but it is one which naturally flows from his own conventionalism.

Holism and Intuitionism

At any rate, the difference which the historicist sees between the two objects of inquiry is just this: a physical system is no more than the sum of its parts, while a social group can never be regarded as merely an aggregation of the individuals which compose it. Social groups have, in other words, a "holistic" character which is not to be found in physical systems. Part of this holistic character, the historicists assert, is the idea of a system having a history which influences the elements of that system. While it may be interesting and informative to study the history of the solar system, any analysis of its present state need not take that history into account, for "the structure of the system, its future movements and developments, are fully determined by the present constellation of its members." (Popper, 1964: 18-19) Given the relevant information regarding the state of the system, and knowing the applicable physical laws, we can predict, as accurately as we care to, the state

of the system at any other time. History is thus in this sense irrelevant. The historicists conclude:

It is obvious that a physical structure differs widely in this respect from any social structure; the latter cannot be understood, nor its future predicted, without a careful study of its history, even if we had complete knowledge of its momentary 'constellation'. (Popper, 1964: 19)

Here Popper points to links between historicism of the anti-naturalistic variety and biological or organic theories of social structures, theories which interpret social groups "by analogy with living organisms." (Popper, 1964: 19) All these factors thus far cited are held by the historicist to render the use of natural science methods inappropriate. A more historical method, that is, a method which has the ability to take into account the historical dimension of social groups is necessary. It becomes necessary for the social investigator to gain an almost "intuitive" understanding of the historical and cultural background of the social group under observation. Not only must the student not try to avoid a subjective connection with his object of study, he must on the contrary actively cultivate such a connection by attempting in various ways to "get in touch" with the culture, to "become one with the

people", and so forth. In this way, it is asserted, the student can gain an intuitive understanding of the group which goes beyond the limits of the cause-effect analysis of natural science.

This "intuitionism" is divided by Popper into three types:

- (1) Understanding a social event by analysing it in terms of the individual and group forces which brought it about. Actions of individuals and groups are to be understood as being in accordance with their aims, whether these be rational or irrational. (8)
- (2) Understanding a social event requires more than a causal analysis, even if the analysis is couched in historical and psychological terms as above. It is additionally necessary to understand the significance of the event. (9)
- (3) Understanding a social event requires, beyond the requirements of the first two variants of intuitionism, that the investigator "... analyze objective, underlying historical trends and tendencies ... prevailing at the period in question, and ... the contribution of the event in question to the historical process by which such trends become manifest. (1964: 22)

These three forms of intuitionism all claim that understanding of social and cultural events is in some sense deeper than is possible in the natural sciences. But at the same time, this understanding cannot occur with the precision which is possible in the natural sciences, a precision which permits laws and findings to be expressed mathematically. This means, of course,

that quantitative methods, even the most superficial use of statistics, will simply not prove to be useful in investigating social questions.

Popper brings up an objection to this latter claim immediately, saying:

When we consider the opposition to the use of quantitative and mathematical methods in sociology, a strong objection must at once occur to us: this attitude seems to be conflict with the facts that quantitative and mathematical methods are actually being used with great success in some of the social sciences. How, in the face of this, can it be denied that they are applicable? (1964: 24)

To this, Popper says, the historicist can respond that there are perhaps some quantitative methods which find a limited use in a very primitive analysis of social phenomena, but this is not the same as expressing a precise relationship among social events in a formal mathematical form. In the first place, most of what occurs in social studies that might be quantified is of a very simple order, demographic statistics being a good example. While it is certainly useful to know population parameters, per capita income, and other descriptive statistics, for an understanding of social phenomena in the sense of Type III Intuitionism these data are demoted to the level of trivia. Secondly, those phenomena which can be quantified in social

studies are quantified through the use of a statistical form of analysis, an analysis based upon elements of probability. The intuitionist claims that this necessarily differentiates social laws, which can be expressed in statistical form only, from natural laws (such as the laws of physics) which are expressed in precise mathematical functions. The problem, in other words, boils down to this: a mathematical precision in social laws would simply require the quantification of things which are inherently non-quantifiable.

Yet a pro-naturalist might still object that this is merely the old problem of "operationalizing" terms. (10) If one physicist, for example, makes the statement "This light beam is greener than that one", another may disagree, but should the physicist break down the relatively subjective reference to "color" into characteristics such as light frequencies, which both physicists agree to accept, even if only for the purposes of the immediate discussion, the term "green" becomes adequately operationalized and there is no problem. Is this not possible in the social sciences? the pro-naturalist will ask. Perhaps we have simply not found that characteristic of, say, social justice, which will permit complete operationalization and therefore also quantitative analysis. At least, the

pro-naturalist will maintain, the possibility of this discovery cannot be ruled out a priori, as the anti-naturalist would seem to be willing to do.

Essentialism and the Problem of Universals

If social science, or history, (11) is essentially non-quantifiable, and the problem of non-quantifiability can be related to the problem of operationalization of terms, this leads Popper directly to the discussion of what he calls the "problem of universals", in his view "one of the oldest and most fundamental problems of philosophy." (Popper, 1964: 27)

The problem is usually expressed in metaphysical terms, but Popper claims that "like most metaphysical problems it can be reformulated so as to become a problem of scientific method." (1964: 27) Basically, there are two very well known positions in dealing with the problem of universals in science. The first position, which Popper chooses to call "nominalism", is that universals differ from proper names only by being names of a set or class of different things which themselves bear either proper or universal names. In

other words, language deals in two types of names: proper names, which denote specific individual things, and universal names, which are used to name a category or collection of things.

The alternative argument regarding this is what traditionally has been known as "realism", but which, for reasons that will become apparent, Popper chooses to call "essentialism". This is the notion that things are named as they are because they partake in some universal object denoted by the universal term. These objects actually exist, in some sense. Popper notes that this is the basis of Plato's doctrine of "forms" or "ideas", and believes further that from a metaphysical principle, it was erected into a principle of scientific method by Aristotle:

The school of thinkers whom I propose to call methodological essentialists was founded by Aristotle, who taught that scientific research must penetrate to the essence of things in order to explain them. (1964: 28)

The difference between an essentialist approach to questions of science and a nominalist approach is that the methodological essentialist will be concerned with questions such as "What is matter?", "What are atoms", "What is light?", "What is Justice?", and so on. The methodological nominalist, on the other hand, will be

concerned with problems such as "How does this system operate?", "Why does this piece of matter behave as it does?", and "What do people think about Justice?". The difference is quite evident. Even the historicist will generally be willing to grant that methodological nominalism has been quite successful in the social sciences. But, he will claim, because of the inherent differences between the subject matter of the two sciences, in-depth understanding in social science requires the adoption of a type of methodological essentialism. (Popper, 1964: 30)

Methodological essentialism goes quite well with an historicist argument, and in fact it is this style of argument which led Plato to his metaphysical essentialism, says Popper. In particular, the Heraclitean argument that changing things defy description was important here:

Science, or knowledge, presupposes something that does not change, but remains identical with itself -- an essence. History, i.e., the description of change, and essence, i.e., that which remains unchanged during change, appear here as correlative concepts. (Popper, 1964: 33)

The relevant notion here is the idea that change, if it is to be perceived at all, must be perceived against a background of constancy. The idea is certainly not a

new one, and it can be seen to be the basis of Heraclitean, Platonic, and Aristotelean analysis. In order to apply this essentialism to history, it requires that we first recognize just what an essence is. The historicist, says Popper, holds that an essence can in fact be interpreted as

the sum or source of the potentialities inherent in the thing, and the changes (or movements) can be interpreted as the realization or actualization of the hidden potentialities of its essence. (This theory is due to Aristotle). It follows that a thing, i.e., its unchanging essence, can be known only through its changes. (1964: 33)

In other words, the historicists say, the way to know social reality is through the study of social change, the study of history.

Pro-Naturalism

Popper feels that most examples of historicist thought are of the anti-naturalistic variety but that nevertheless it is not simply the opposition to the use of natural scientific methodology that defines historicism. It is perfectly possible to support this usage and yet still retain the basic historicist outlook described earlier. There are points, in other words, at which historicism believes that the elements

and aims of natural science and sociology (to use Popper's term) coincide. One of these points, and this is an idea which Popper shares, is that both sciences aim at the same time to be both theoretical and empirical:

By saying that it is a theoretical discipline, we mean that sociology has to explain and to predict events, with the help of theories or of universal laws (which it tries to discover).

Furthermore,

By describing sociology as empirical, we mean to say that it is backed by experience, that the events it explains and predicts are observable facts, and that observation is the basis for the acceptance or rejection of any propounded theory. (Popper, 1964: 35)

We need to note that Popper fully agrees with this notion. He agrees that this is what being theoretical means, and that this is what being empirical means. And he furthermore agrees that both of these aims are or should be common to both natural and social sciences. The real difference between Popper and the historicist primarily revolves around the emphasis which the historicists are willing to give to theory and empirical observation in analyzing history and

social events in general. The pro-naturalist historicist will often claim that history, as being a series of observations, is really the only observational and empirical source of social knowledge. From this perspective then, sociology is simply theoretical history, in that all forecasts in the social sciences must also be of an historical nature, based upon historical observation.

It is possible in the natural sciences to engage in prediction of events which are to occur in the distant future. Long-term forecasting of this type is envied greatly by social scientists and the pro-naturalistic historicist believes that there is nothing inherent in the social sciences which prevents them from achieving the same goal. As Popper puts it "if it is possible for astronomy to predict eclipses, why should it not be possible for sociology to predict revolutions?" (Popper, 1964: 36) Well, it is possible, says the historicist, but we must remember that the sociologist cannot expect as much detail in his predictions. We saw earlier that an "exact scientific calendar of social events" is logically impossible. The simple fact that the human predictor is himself an element of the society about which his prediction speaks, creates a type of circularity which prevents

the prediction from acquiring any detail. But, says the pro-naturalist, we can make up for the sacrifice in detail by broadening the scope of our predictions. Short-term predictions, and predictions which require the presentation of minute detail, are practically impossible, and sometimes logically so, but long-term predictions which deal with general characteristics of society are not rendered impossible by this same logic, and are therefore open to sociologists.

Since we cannot really experiment in the social sciences, or at least cannot conduct the type of experiments which make these large scale forecasts possible, we must make use of the only empirically observable data available to us, and these data are the chronology of historical events. Sociology is really theoretical history, in that all forecasts must be of an historical nature. This is an important point for Popper, for the historical character of forecasts means that any testing by experience of these forecasts will have to occur sometime in the future.

Now there are two ways of testing scientific forecasts by experience. We may attempt to verify them, by amassing observations which coincide with our forecast, or we may attempt to falsify them, by searching for experiences which directly contradict the

forecast. As we have seen, Popper rules out the possibility of verifiability in science, but the pro-naturalistic historicist here has ruled out the possibility of falsifiability. This is so because no present experience can be utilized to falsify a forecast which will occur only in the future. This is intrinsically different from Popper's view of the natural sciences, in which forecasts can be presently falsified, by finding facts which contradict the universal law on which the forecast was based.

The task of a science is not simply the collection of observable facts (indeed, this is impossible); it is also the arranging of these facts in an order in which conclusions, in the form of predictions, can be drawn from them. This ordering is typically known as a theory, an hypothesis, or a law. If, for the pro-naturalist, these theories and predictions can only really be expressed in sweeping general terms, then any real social laws can only be "generally valid". Popper traces where the logic of this position leads:

But this can only mean that they [the laws] apply to the whole of human history, covering all of its periods rather than merely some of them. But there can be no social uniformities which hold good beyond single periods. Thus, the only universally valid laws of society must be the laws which link

up the successive periods. They must be laws of historical development which determine the transition of one period to another.
(Popper, 1964: 41)

This curious position is seen to be the result of a demand by the historicist for both predictability, thus generalizability and law, and at the same time a demand for a type of cultural relativism which confines the operation of particular sociological laws within the boundaries of a particular society or a particular historical epoch. The balancing act between these two opposite demands, the demand for laws and the demand for "not-laws", is a tricky one indeed, and is one in which the historicist succeeds only by transferring his theoretical analysis to the level, not of individual behavior, but of the behavior of something called "history". (12)

To return to the notion of prediction in general, Popper notes that there are a lot of different types of predictions made by historicists, short and long term, detailed and vague. But they have one thing in common, and that is the notion that "sociological study should help to reveal the political future, and that it could thereby become the foremost instrument of far-sighted practical politics." (Popper, 1964: 42) We can class predictions into two types: those which predict events

which we are powerless to prevent, and those which predict events which in some way depend upon human agency, and which, therefore, we may find ourselves in a position to prevent. In the physical sciences, this distinction may or may not be important. For example, a prediction, based upon general laws, which details the future activity of sunspots is certainly engaged in predicting activity which we are powerless to affect. This in no way makes that prediction any less legitimate. Alternatively, we could make predictions based upon general physical laws which require for their fulfillment some type of human intervention. The inflation of an automobile tire, for example, is dependent upon general physical laws of air pressure and material elasticity. We could make a prediction such as the following: if, given the general parameters of this physical system (pressure and elasticity), a human being applies air pressure to the tire exceeding these parameters, the tire will explode. We may assume for the moment that the tire will not explode in the absence of this human intervention.

Now Popper wishes to call this first type of prediction, in which human agency cannot be involved, "prophecy", and he assigns the term "technological prediction" to the prediction which is conditional upon

human intervention. This distinction is just as important as we are likely to make it in the physical sciences, but in the social sciences, this distinction becomes of much greater importance. For in historicist social science, Popper wishes to argue that the aim of all prediction is in fact prophetic. (Popper, 1964: 44) Historicists, he says, consistent with their belief that sociological experiments are impossible, argue instead for historical prophecy, and argue that this is really the aim of all social science. This does not, however, preclude thinking on the part of the historicists that some type of planning for the future is possible, to the extent that this might arrest, control, or quicken impending social developments. We have already seen Popper's comments on Marxist activism in this regard.

Social Midwifery and Moral Historicism

In fact, in the section entitled "Interpreting versus Planning Social Change" in Popper (1964), Popper notes that most historicists have very marked tendencies towards activism. For in spite of the historicists' emphasis on prophecy, they in no way teach that human beings are incapable of bringing

something about in history. This would put an historicist in a highly untenable position, for it would reduce historicism to a type of physical determinism, or what in some philosophical schools is known as "hard" determinism. (Cf. for example the discussion in Taylor, 1975: 160-163)

Hard determinism leads to difficulties on purely theoretical grounds. If every action is entirely defined and caused by prior actions and events, the idea of a free human actor becomes logically impossible. This obviously greatly reduces opportunities for concretely affecting human social activities. And, taken to its logical extent, it would have to lead to a program of human action which is essentially no program at all. Human beings, when faced with a social situation, whether regarded as good or bad, would have to just sit there and take it.

St. Augustine, for example, while not your typical historicist, (13) takes this type of "passive" view of human activity in history. In Book V, Chapter 9, of The City of God (Augustine, 1972), Augustine deals with Cicero's argument against foreknowledge of history. He presents the argument so:

If the causal order is fixed, determining all events, then all events, he [Cicero]

concludes, are ordered by destiny. If this is true, nothing depends on us and there is no such thing as free will. "Once we allow this," he says, "all human life is overthrown. There is no point in making laws, no purpose in expressing reprimand or approbation, censure or encouragement; there is no justice in establishing rewards for the good and penalties for the evil." (from Cicero, De Fato, 17, 40; in Augustine, 1972: 191)

This argument of Cicero's is certainly one of the more lucid and compact accounts of the problem of hard determinism. Augustine notes "... [Cicero] constrains the religious soul to this dilemma, forcing it to choose between those [sic] propositions: either there is some scope for our will, or there is foreknowledge." (Augustine, 1972: 191) Augustine points out that since Cicero is a man of "eminent learning", who has had wide experience in practical matters and therefore experiences human actions influencing other human actions, Cicero is forced to choose free will and to deny the possibility of historical foreknowledge.

Augustine calls this "profane and irreverent impudence" and asserts instead that there is an argument to be made which Cicero overlooks. Just because there is for God a fixed order of all causes, this does not necessarily mean that nothing will depend upon our free choice:

Our wills themselves are in the order of causes, which is, for God, fixed, and is contained in this foreknowledge. Such human acts of will are the causes of human activities. Therefore, he who had prescience of the causes of all events certainly could not be ignorant of our decisions, which he foreknows as the causes of our actions. (Augustine, 1972: 192)

We see in this little argument all the points which Popper wishes to make about historicist activism. It is clear to Cicero that the dichotomy between hard determinism, which results from an ability to prophesy the future perfectly, and free will, is one which must be resolved in favor of the latter. For Cicero, one must completely deny the possibility of foreknowledge of fate, if not the reality of fate itself, in order for human activity to have any meaning. The notion that human activity is meaningless in the presence of hard determinism is one which Popper calls "passivism", and he says:

Now I must admit that I am certainly out of sympathy with this "passivist" view, and that I even believe that a policy of universal anti-interventionism is untenable --- even on purely logical grounds, since its supporters are bound to recommend political intervention aimed at preventing intervention. (Popper, 1964: 60-61)

This is precisely the argument which Cicero makes, and

Augustine responds to it precisely as would an historicist. For Augustine claims that we can in fact have our cake and eat it too. That is to say, there can be a preordained order to history in which humans can have free will, even if this "free will" is yet bounded by this historical nature.

To make this argument, Augustine returns to the distinction between a prime cause and an efficient cause, ascribing to God the role of prime cause, and giving him the power to determine all of history, including the past, current and future free choices of human beings. But he demotes the freedom of will of human beings to the level of an efficient cause. In order to understand all of his argument, it is necessary to go back to the doctrine of the Fall. We need only note here that prior to the Fall of Adam, man was given the power to behave as a prime cause. To this extent, humans were fashioned in God's image; they were at least "semi-divine". Their free will extended to being free to choose between good and evil. They had the ability to choose "not to sin", in Augustine's outlook. After the Fall, however, human free will was demoted to the freedom to choose only among sins, to choose between one sin and another. Humans could no longer choose not to sin. There is,

then, a sense in which human free will is bounded: it is bounded by man's now-sinful nature. But within these not inconsiderable bounds, human beings are perfectly free to act as efficient causes of events preordained by God as prime cause.

Determinism logically leads to the doctrine of passivism, but passivism is itself logically self-contradictory, as Popper has shown, for it leads to interventionism on behalf of non-interventionism. The historicist overcomes this problem much in the same way as Augustine did, by demoting the role of interventionism, of activism, to the level of an "efficient cause", to use Augustine's phrase, or "social midwifery", to use Popper's:

Only such plans as fit in with the main current of history can be effective. We can now see exactly the sort of activity admitted by historicists to be reasonable. Only such activities are reasonable as fit in with, and help along, the impending changes. Social midwifery is the only perfectly reasonable activity open to us, the only activity that can be based upon scientific foresight. (Popper, 1964: 49)

And only those actions of sinful man which fit in with God's overall plan of sacred history can be regarded as "reasonable" or "good" for Augustine. Popper gets his notion of midwifery from a passage in Marx's "Preface"

to Capital which is worth quoting in full:

... even when a society has got upon the right track for the discovery of the natural laws of its movement --- and it is the ultimate aim of this work, to lay bare the economic law of motion of modern society --- it can neither clear by bold leaps, nor remove by legal enactments, the obstacles offered by the successive phases of its normal development. But it can shorten and lessen the birth-pangs. (Marx, 1967, I: 10)

Yet Popper is not as concerned with the problem of free will as he is with the problem of the proper role of reason. Just as Augustine's human as efficient cause gives free will a role to play in the grander scheme of things without giving it the ability to affect radically the scheme itself, historicist reason also has a limited ability to influence history, "for it is scientific reasoning, historicist social science, which alone can tell us the direction any reasonable activity must take if it is to coincide with the direction of impending changes." (Popper, 1964: 50) The ineluctable movement of history cannot at the same time be known by human reason and also affected by it, for that would create the same type of logical problem which is expressed in Popper's treatment of the Oedipus effect and which is expressed by Cicero's dilemma. If reason can affect the course of history then it is impossible to know the whole of history, to the extent

that it includes the future, for the future is subject to change at any given moment, through any volitional act of human reason. If, on the other hand, it is possible to know this history in its entirety, then human reason cannot have a part to play in the shaping of the future. Reason must then be demoted in the manner of Augustine's free will to the role of efficient cause, and the historicist does this through prescribing human activity which is in accordance with preordained historical laws.

But this must be scant comfort to human beings. Augustine's escape from the dilemma is accomplished at the expense of a "stunted" free will, not at all the type desired by humans, a fact he recognizes when he calls Cicero "profane and impudent". For this desire is precisely a desire to have an effect on human future in the sense of control over human destiny. Augustine is not willing to permit this, giving human destiny over to Divine design. Nor is the historicist willing to permit this. In fact, the historicist reverses the traditional role reason has to play in free will, by defining as reasonable those human actions which are in accord with the inescapable conclusions of history.

This type of historicism offers hope for humans only if the historicist takes an optimistic view of

historical development, believing that this development is intrinsically good or rational. He must believe that rationality is bound up in the course of human history. This means that history is the only thing which is rational, and that humans can share in this rationality just to the extent that their actions coincide with historical trends. There is, then, no rationality independent of that rationality which is possessed by history. But this optimistic view of history "would amount to a belief in social and political miracles, since it denies to human reason the power of bringing about a more reasonable world." (Popper, 1964: 50) As Marx has shown, activism can only be considered rational so long as it acquiesces in the prophecised impending changes.

Popper's use of the term "miraculous" is well-considered here. It is exactly what Augustine would claim. To the extent that human social conditions improve in history, we may look only to Divine intervention, God's kingly grace, with gratitude. Popper is not willing to go along with this, and returns to the objections raised by Cicero. If the foreknown course of history yields a conclusion which humans are loathe to accept, activism can have no point, and our participation in history is reduced to

one of existential despair and pessimism. Even the optimistic view of history, that is, a view which holds for the ultimate progress towards a humanly acceptable goal of history, falls flat in its attempt to assign meaning to human activity. For as long as the opportunity to affect the course of history in a radical sense is denied us, any social improvement must be based upon the miraculous good will of history itself. If this good will is not divine in origin, if it is not intended by some sort of consciousness, one which is capable of intent, then it must be the result of pure random chance (in the Nietzschean style) and humans can take little comfort in this. (14) Popper concludes by stating that "the leanings of some historicists towards optimism or activism are defeated by the outcome of the historicist analysis itself." (Popper, 1964: 52)

The historicist can perhaps finesse this problem by denying a necessary connection between social activism and the requirements of historicism as a methodology. But this is not typically what the historicist will do. And it is certainly not in keeping with the aims of the historicist who wishes to transform the social sciences into an instrument for political action. If this is to be the aim of the

historicist approach, he cannot deny the possibility of activism. But the type of activity which the historicist can condone as reasonable would have to be that activity which is in keeping with the direction of history as it is known through scientific investigation. The problem of the selection of appropriate methodologies presents itself in the form of a paradox: indeed, the assertion of the historicist that his methodology is the best or only possible one becomes a tautology, for the only rational choice of a methodology is one which accords with the laws of history, which laws are discoverable only by that methodology.

Moreover, since the requirements of reason are often the requirements of morality, the assertion that the most reasonable attitude is to adjust one's system of values to conform to the future direction of history amounts to a moral system. Therefore, historicism can be examined as more than simply a doctrine of methodology; it can be looked at as a moral system, and as such, Popper finds it wanting. (Popper, 1966, II: chap. 22)

(1) Popper will not stand on definition, as he repeatedly makes clear. (Cf. many discussions on "essentialism" and definitions in Popper, 1964; 1976; 1979; 1962). Indeed, his unwillingness to quibble over the definitions of words is thought by him to be a primary difference between himself and the Vienna Circle (Cf. Popper, 1976, chap. 17).

(2) The reader should be aware of the fact that Popper has only rarely published anything as soon as he has written it, and those works which were first published in a foreign language were subject to a considerable delay before being translated into English. For example, Popper (1964) was originally written in the mid-1930's (Cf. the "Historical Note", p. v), Popper (1968) was originally published as Logik der Forschung in 1934, and his Postscript to the Logic of Scientific Discovery, published in three volumes (Popper, 1982; Popper, 1983; and Popper, 1983a) was written in 1956. The reader should keep these dates in mind.

(3) There is no need here to enter into the obvious discussion on the merits of historical relativism. The reader need only note that the doctrine of relativism can be turned back on itself, indicating a certain weakness. If all social laws are in fact dependent upon historical situation for their validity, for example, what can be said about the validity of this "meta-law" itself? The parallels to Marxism which may be drawn are obvious.

(4) (Popper, 1964: 7-8) In this regard, Popper here points to Marx's famous Number XI of his Theses on Feuerbach: "The philosophers have only interpreted the world, in various ways; the point, however, is to change it." (Marx, 1978: 145) While Popper cites this in support of the activist tendencies of the anti-naturalistic version of historicism, we might also note that Marx's use of the phrase "in various ways" might seem to put him in the camp of the relativists.

(5) These terms are the author's, not Popper's.

(6) Popper's answer to this charge comes in the form of his notion of the "three worlds" with which human beings interact. Briefly, knowledge which is "objective", yet still human, can take place within "World 3", which is basically a world of human

artifacts. We will deal with this extensively in Chapter 5.

(7) The recognition of this problem often leads to a program of study which appeals primarily to "the predilections and interests prevailing in a particular historical period", which is generally known as "historism", not to be confused with "historicism". An approach which reduces these distinctions to differences in political or economic or class interests, is of the type known as the "sociology of knowledge". Popper's disdain for both of these is evident.

(8) This form of intuitionism is expressed in current anthropological theory by referring to "emic" analysis of the situation. The opposite type of analysis which views and renders judgement on the structure from without is termed "etic". The terms are due to Kenneth Pike (1967), and used extensively by Harris (1979).

I.C. Jarvie (1969) traces the history of methodological disputes in anthropology, showing that "emic" styles of analysis owe their popularity largely to the development of structural-functionalism by Malinowski.

(9) (Popper, 1964: 21) Popper analyzes this notion by sparring with the historicist, asking what is meant by understanding the "meaning" and "significance" of a social event. The reply, he notes, would be that "a social event not only exerts certain influences, it not only leads, in time, to other events, but its very coming into existence changes the situational value of a wide range of other events. It creates a new situation, demanding a re-orientation and re-interpretation of all objects and of all actions in that particular field." (Popper, 1964: 21) Again, we note the paradoxical position such a line of reasoning holds for the researcher. If every new social event (and they are all novel, after all) changes the meaning of all subsequent social events, the meaning of everything changes momentarily. This arbitrarily quick "pushing" of meaning into the future leaves one breathless.

(10) In social science, "operationalization" refers to the process of "conveying the meaning of a

term by specifying the operations required to test for the presence of the thing to which the term refers." (Rudner, 1966: 20)

(11) Throughout this discussion, by the way, physics is being considered as the supreme example of a natural science, and history as the example of social science (or "sociology"). As Popper notes, the argument that the historicist will make is that "Social science is nothing but history: this is the thesis." He continues: "Not, however, history in the traditional sense of a mere chronicle of historical facts. The kind of history with which historicists wish to identify sociology looks not only backwards to the past, but also forwards to the future. [That would obviously have to be the case if indeed they are involved in formulating general historical laws. -- M.B.] It is the study of the operative forces and, above all, of the laws of social development." (Popper, 1964: 45)

(12) Note that this also makes the not inconsiderable assumption that indeed there are such things as historical epochs. This is, of course, a question that has plagued historians for a long time. When, for example, did the Enlightenment begin? A recent article in the American Spectator declared the Enlightenment to be over. When did it end? What were the Middle Ages or the Dark Ages if not simply categories imposed upon history by historians? The point is, the assumption that the historicist makes that there are such things as epochs is one that by no means deserves to go unchallenged.

(13) Augustine has all the elements of an historicist for Popper, for he does purport to understand the overall meaning and goal of history, but he understands this history in the light of the meaning which is given to it through Divine intervention. The more interesting type of historicist for Popper does not generally deal with concepts of Divinity (with the possible exception of Hegel). We shall see that to the extent that the historicist ascribes the motion of history to some type of "spirit" or "consciousness", Popper would certainly consider this to be every bit as superstitious and unscientific as the work of Augustine. (Cf. Berheide, 1982)

(14) See for example Nietzsche's "On Truth and Falsehood in the Extra-Moral Sense", where his despair over the situation is apparent in his opening phrases:

In some out of the way nook of the universe, glitteringly diffused in countless solar systems, there once was a star on which intelligent animals invented knowledge. It was the most arrogant and mendacious minute of "world history" -- but, however, only a minute. After nature drew a few breaths, the star grew cold and the intelligent animals had to die. -- Thus could one make up a fable and yet would not have sufficiently illustrated how wretched, how purposeless and arbitrary the human intellect appears in nature. (Nietzsche, n.d.: 1)

IV. HISTORICISM AS UNSCIENTIFIC AND UNFRUITFUL

Most social theories are primarily the
autobiography of the theorist.

--- Richard Neely

Criticism of the Anti-Naturalistic Doctrine

As we have noted, Popper believes that the ultimate criticism of any methodology can only be that it does not yield the desired results. In his 1964 work, he sets out to criticize historicism as a poor and unfruitful method, and he bases this criticism on historicisms' own claims. The historicist believes that his approach to the study of social science is one which can transform the social sciences into a powerful instrument of social change in the hands of the politician. Popper finds no fault with this practical aim, and indeed believes that the ends of social science should be the transformation and use of social institutions so that they may serve as a means for the resolution of practical human problems.

There has always been an ongoing controversy regarding the proper aims of the scientific enterprise. Should science be practiced with an eye towards gaining knowledge for its own sake, or should it be practiced with the goal of solving practical human problems?

This is the controversy between basic and applied research. Popper tends toward the former view, believing in the value of basic research, even going so far as to appreciate the "spiritual" benefits which one can derive from the practice of science. But he believes that the dichotomy between the aims of basic and applied research is a false one and wishes instead to advance the thesis that the two parts to the controversy are in fact inseparable, since practical problems act both "as a spur and a bridle" to basic research. (Popper, 1964: 56)

He appreciates Kant's formulation of the problem:

To yield to every whim of curiosity, and to allow our passion for inquiry to be restrained by nothing but the limits of our ability, this shows an eagerness of mind not unbecoming to scholarship. But it is wisdom that has the merit of selecting, from among the innumerable problems which present themselves, those whose solution is important to mankind. (f)

Even the debates on scientific methodology themselves are, as Popper notes, often inspired by the practical problems of researchers. Certainly Popper's critique of the historicist method is so inspired, since one of the reputed problems of historicism is that it brings about some terrible results. (Popper, 1964b: passim) So Popper does not criticize the interventionist aims

of the historicist; rather, he is concerned that these aims cannot be fulfilled by the historicist approach. Let us see why this must be so.

Piecemeal Engineering

We recall that strictly universal laws can be expressed in a "technological form" which asserts that some event is impossible or that something is not the case. Popper believes that this is the appropriate form to use for the solution of social problems, and an approach which uses this form he calls "piecemeal engineering", to be distinguished from "utopian engineering". The historicist typically takes a utopian or holistic approach to problems, emphasizing the future goal of history and consigning human activity to taking place within the confines of the movement towards this goal. We have seen that this imposes some moral constraints on human activity: the morality of an action is determined by its congruence with this future goal. But the approach of the piecemeal technologist is morally neutral, claims Popper, because the technologist is not concerned with what is going to happen in the future; instead, his job is to point out what cannot be achieved (Popper,

1964: 61), by using the technological form of scientific laws. All that technology may say about the ends of human activity is whether or not they are compatible with each other, or whether they can be realized in the first place. This, he claims, renders them morally neutral. (2)

While the holistic historicist tends to view society in the manner of an organism, a functioning whole, the piecemeal technologist recognizes that only a minority of social institutions have been consciously designed by humans, and that most, on the contrary, have simply grown up as the undesigned results of human activity. This does not mean that these institutions cannot be instrumental or functional in some way, but the technologist will treat them rather as machines than as organisms. Popper has a modestly famous aphorism, with which he is greatly pleased, that expresses this: "Institutions are like fortresses, they must be well designed and properly manned." (3) The "institution-as-machine" metaphor reintroduces the human element in social change. An organism, after all, behaves on its own. It may interact with its environment, but its actions are not thereby determined (ignoring for the moment the problems of hard determinism). A machine, on the other hand, must be

operated and an institution must therefore be manned.

One of the problems of holistic or utopian social engineering (Popper uses the terms interchangeably) as opposed to piecemeal social engineering, is that the former does not adequately address the distinction between private and public interests. Apparently, Popper means that whatever is concerned with the whole is public, and utopian social engineering programs believe that all things can only be dealt with in the context of the whole, for this is the fundamental principle of holism.

We can see an example of the elimination of the distinction between strictly private affairs and public ones admirably accomplished by Marx, when he writes:

Activity and consumption, both in their content and in their mode of existence, are social; social activity and social consumption; the human essence of value first exists only for social man ... only here does nature exist as the foundation of his own human existence. (Marx, 1978a: 85)

Here Marx is expressing the idea that since all individual activity is in some way affected by other individual activity, or affects it in its turn, there can be no such thing as purely private activity, or purely private property. That we continue to speak and perceive in terms maintaining this private nature of

action is merely the result of the imposition of false consciousness by our class-dominated social structure. Once this structure is done away with, the truly public or social nature of all human events will be fully and consciously realized.

Holists such as Marx reject the piecemeal approach in favor of a radical restructuring of the "organism", but their own approach degenerates into a piecemeal one, claims Popper, and their utopian engineering turns into mere improvisation, which is to say "unplanned planning": "Thus the difference between Utopian and piecemeal engineering turns out, in practice, to be a difference not so much in scale and scope as in caution and in preparedness for unavoidable surprises." (Popper, 1964: 69) The surprises are unavoidable for the utopian engineer because he ignores the technological formulation of a social law, that formulation which expresses those things which cannot be done. The piecemeal engineer concentrates on just this, he knows that certain things cannot be accomplished in certain contexts, and is not surprised when these ends are not realized. The piecemeal engineer can attack any problem with an open mind as to the scope of the reform. This is impossible for the holist, for any real reform must necessarily involve a

complete reconstruction of the social milieu, since the "organism" can only be dealt with "holistically". To return to the metaphor, a machine may be reprogrammed and redirected towards different ends, while still retaining its basic form and structure, but an organism must evolve into a recognizably new form (or be replaced) for any change in its program to be effected. This prejudices the holist against the possibility of limits on social control, limits which can be expressed in technological form. Thus, "By a rejection a priori of such hypotheses, the Utopian approach violates the principles of scientific method." (Popper, 1964: 69) Holism and historicism refuse to play the game according to Popper's rules. And in light of this criticism, Popper would regard Marx's claims of a "scientific" study of society as unsubstantiated.

In spite of Marcuse's claim that Popper does not really deal with any particular historicist thinkers, we might briefly turn to Popper's examination of the thought of Karl Mannheim, for another example of holistic thinking. Popper calls Mannheim's Man and Society in an Age of Reconstruction (1941) "the most elaborate exposition of a holistic and historicist programme known to me...." (Popper, 1964: 67, n.2) In his chapter entitled "The Problem of Transforming Man"

(a title which Popper finds particularly suggestive and significant) Mannheim states:

The political problem, therefore, is to organize human impulses in such a way that they will direct their energy to the right strategic point, and steer the total process of development in the desired direction. (Mannheim, 1941: 199-200, my emphasis)

Popper responds:

It seems to escape the well-meaning Utopianist that this programme implies an admission of failure, even before he launches it. For it substitutes for his demand that we build a new society, for men and women to live in, the demand that we "mould" [sic] these men and women to fit into his new society. This, clearly, removes any possibility of testing the success or failure of the new society. For those who do not like living in it only admit thereby that they are not yet fit to live in it; that their "human impulses" need further "organizing". But without the possibility of tests, any claim that a "scientific" method is being employed evaporates. The holistic attitude is incompatible with a truly scientific attitude. (Popper, 1964: 70, my emphasis)

Testability, in the form of falsifiability, is the sine qua non for a scientific method, and holistic historicism fails on this account.

There is another reason that Popper notes for considering holism to be unscientific, and that is that it contains an element of perfectionism. To the extent

that this is true, Popper calls holism "prescientific", rather than simply unscientific, indicating that he ranks it with religion, sorcery, mythology, and superstition in general. Holism, he claims, seeks to provide a heaven on earth, but the technological scientist realizes that this is impossible and once we realize that we can "only improve matters a little, we also realize that we can only improve them little by little." (Popper, 1964: 75, n.3)

Of course, holism and historicism are not one and the same thing, but the similarities between the two are such that there is a natural affinity present. The historicist naturally tends towards a holistic viewpoint, and vice versa. Popper claims that Plato and Marx are two good examples of this "unholy alliance" between holism and historicism. The peculiar fascination of the historicist with holism is based, Popper believes, on a confusion of two senses in which we can deal with "the whole" of something. We can consider wholes as either "totalities" or "Gestalten", and the entire problem revolves around confusing the gestalt characteristics of an object of study with the totality of that object. For gestalten do not represent the totality as such, they are instead only particular characteristics of that totality:

If we wish to study a thing, we are bound to select certain aspects of it. It is not possible for us to observe or to describe a whole piece of the world, or a whole piece of nature; in fact, not even the smallest whole piece may be so described, since all description is necessarily selective. It may even be said that wholes [in the sense of totalities] can never be the object of any activity, scientific or otherwise. (Popper, 1964: 77)

Now holists not only plan to study society and history as a totality, but to reconstruct it as such. The desire for such a reconstruction indicates a totalitarian mentality and nothing else. Popper does not see any other possible reason for this desire: "... what, apart from conveying this intuition, does the prophecy mean?" (Popper, 1964: 79)

A holistic approach to the reconstruction of society is foredoomed to failure, for such an approach would require a totalitarian-like control over all social relationships, and this is impossible. With every new control, new social relations are created which in turn require controlling:

In short, the impossibility is a logical impossibility. (The attempt leads to an infinite regress; the position is similar in the case of an attempt to study the whole of society --- which would have to include this

study). (Popper, 1964: 79-80)

It is possible for the historicist to attempt to get out of this logical dilemma by simply denying the validity of logic and attempting to supercede it with something called "dialectic". But these attempts have all failed, and Popper refutes them in his work "What is Dialectic?" (Popper, 1962: 312-355)

Very briefly, "dialectic" in the modern sense is based upon the idea that criticism of an idea or construct, the thesis, occurs in the form of an antithesis, and this criticism produces the third element of the triad, the synthesis, which thereupon becomes the new thesis. The new thesis is then a combination of the good elements of both the thesis and the antithesis. Against this notion, Popper argues that the real way science proceeds is by proposing hypotheses and then refuting them. What may appear to be rejecting only bad parts of the thesis and retaining the good parts is actually separation of the thesis into several scientific hypotheses which may be rejected or accepted in their turn. When an hypothesis is rejected, it may occur that a new hypothesis is not immediately available to take its place. This in fact happens quite frequently in the natural sciences.

Thus, we are never guaranteed any sort of "synthesis".

(4)

The attempt to raise dialectic from a process of individual knowing to a characteristic of history itself, as in Hegel or Marx, is also doomed to failure. Such an holistic view of history is required by an holistic attempt at social reconstruction, but is logically impossible, says Popper, for "Every written history is a history of a certain narrow aspect of this "total" development, and is anyhow a very incomplete history even of the particular incomplete aspect chosen." (Popper, 1964: 81) It simply is not possible for any individual, himself bound up within the course of history, to know, study, or describe the totality of history, for that study also would have to include itself. All knowledge is partial knowledge and can never produce unshakeable evidence regarding the nature of the whole. This point will become a key to Popper's later argument that historicism is not only unfruitful, but in fact false.

Holism or utopianism usually admits that we do not possess the experimental knowledge needed for any such undertaking, of course. This was the objection of the anti-naturalistic historicist, remember. But there exists a kind of utopianism which finds that

experiments can indeed be carried out at the level of the entire society. We can perform "holistic experiments". This version of utopianism sees the type of experiment which is limited to say, only a village or a factory or a commune, as simply "utopian dreaming", since it is neglectful of historical trends. This was Marx's objection to socialist liberalism. (5)

Popper raises two objections to the idea that there can be holistic experiments. The first objection is a theoretical one, and turns out to be perhaps not such a good objection after all. He claims that the holistic approach overlooks the piecemeal experiments which are essential for all scientific knowledge. This viewpoint accords with his incremental view of the progress of science in general. The belief in holistic knowledge leaves unexplained, he believes, the fact that we already possess a great deal of knowledge of social reality derived in a piecemeal experimental fashion. Personal experience is one such method. Remember that for Popper all human activity, even biological activity, can be understood as the positing of bold hypotheses and attempting to falsify them. But accusing the holists of not recognizing the knowledge gained through this type of experimentation is at least in part beside the point, for the holist can simply

claim that there are other forms of knowledge besides scientific knowledge. Indeed, the anti-naturalistic historicist is making this claim when he says that the study of society cannot be conducted in a "scientific" fashion. Taking this view, one would not have to regard social reforms, even radical ones, as "experiments" at all. Instead, they may simply be attempts to implement knowledge which is already regarded as certain.

The second objection to holistic experimentation is made on practical grounds, although it is related to the logical problem of instituting any social experiment. In a situation in which radical change is effected, it is, in a practical sense, impossible to control for social variables, and it therefore becomes difficult to determine what particular actions are responsible for what effects in the process. If we do decide to attribute a certain result to a certain measure, we can do this only on the basis of some previously gained knowledge, and not from the results of the holistic experiment itself. But again, this has always been the claim made by Marxists. More important for practical purposes perhaps, is the effect which the totalitarian centralization of political power has on the pursuit of inquiry. For the holistic experiment

overlooks the fact that while it is relatively easy to centralize power, it is not easy to centralize the necessary knowledge. (6) The holist must attempt to exercise some control over people's minds, in order to control social interactions. But this attempt "must destroy the last possibility of finding out what people really think, for it is clearly incompatible with the free expression of thought, especially of critical thought." (Popper, 1964: 90) Since for Popper knowledge occurs in the form of critical thought, the destruction of critical thought means the destruction of knowledge. And he concludes that "the greater the gain in power, the greater will be the loss of knowledge." (Popper, 1964:90) This loss of knowledge extends across all fields of investigation. Popper is alluding to the fact that in order to have a good natural science, one must first have a good political science. Numerous examples can be advanced which support this position, one of which leaps immediately to mind is the Lysenko affair in Stalinist Russia. (7)

One of the worst offenders in the supplanting of critical scientific knowledge with totalitarian dogmatics is Marxism, according to Popper. (Popper, 1966b, II: passim) Curiously, Popper holds Marx in high regard as a sensitive critic of social structures,

but he believes that Marx's eagerness to do away with certain serious problems of injustice in his contemporary society led him astray from the path of a critical scientific attitude. (Popper, 1966b, II: 199-200) Instead of developing an open, scientific approach to the solution of these problems, Marx's highly-developed moral sensibilities caused him to jump on the bandwagon of the radical transformation of society. He became a dogmatic historicist and, indeed, a utopianist in the sense mentioned above, despite his protestations to the contrary. (8)

Maurice Cornforth (1968) takes issue with Popper's claims about Marxism being dogma, and wishes to show that, far from this being the case, Marxism is really science, even according to Popper's criteria, and that it is the "open philosophy" leading to the "open society". Unfortunately, nearly all of Cornforth's work is beside the point of Popper's criticism of Marxism, and of closed societies and ideologies in general. Let us see why this is so.

Popper has given us a number of prescriptions for the maintenance of a social order which would be "open", in the sense of being open to change and criticism. For example, he has maintained that free speech is a sine qua non for an open society, because

only in an atmosphere of free communication and criticism can the scientific process take place (it is required for intersubjective testability), and only if we can have recourse to the scientific method can we pare away at the falsehood and mistakes which we commonly experience. We must have social institutions which not only permit freedom of criticism, but which are structured in such a way as to encourage criticism and to distribute efficiently the ability to criticize among relevant members of society. Cornforth recognizes this point, but proceeds to embark on a tirade against Popper's view of an open society:

But, one may ask, is a society really "open" when social production is tied to ensuring the accumulation of capital from surplus value, and the enjoyment of benefits by some depends on exploiting the labour of others? And can one's mind be really "open" so long as one is unable to see that such is the case with contemporary capitalist society, or to see the possibilities of advance which could be opened up for mankind if only the exploitation of man by man were done away with? So far from Marxism being a system of dogmas to close our minds and discourage the unfettered exercise of reason to work out how best to promote freedom and the brotherhood of man, it systemises [sic] a way of thinking to open our minds to the appreciation of things as they are and the practical possibilities of changing them for the better. (Cornforth, 1968: 6-7)

The first two questions which Cornforth

rhetorically asks us in this quotation are certainly legitimate concerns, but they do not seem to be concerns about which Popper would argue. Certainly we can ask whether structural defects in our current economic and social system hinder us in the pursuit of the open society, and we can also question whether or not minds which are in turn limited by this framework afford us the ability to criticize the framework. But this is exactly Popper's contention. We must remain suspended in a state of constant criticism of current common wisdom and of current scientific knowledge, and this is the core of his methodology. So far from it being an apologia for capitalist society, Popper takes great pains to point out the very real criticisms which Marx levels against the brutishness and inhumanity which he observes to be part of the capitalist system.

Indeed, Popper would maintain that any "system", capitalist, socialist, political, scientific, religious -- or Marxist -- is by its very nature inimical to true scientific inquiry, because as a system, it imposes necessary constraints on this methodology. It refuses to permit certain questions to be asked. This problem of the "prohibition of questions", to use Voegelin's (1968) phrase, is the problem of the maintenance of a "framework" within which science is constrained to

operate. Popper has some interesting things to say about the relative "rigidities" of various frameworks which we will examine a bit later. We need only reassert here that any systematic attempt to impose a dogmatic structure or framework on the operations of science automatically closes off the possibility of true scientific progress.

The second part of Cornforth's quotation betrays exactly this tendency which Popper wishes to avoid. Saying that Marxism "systemises" a way of thinking to open our minds is a self-contradiction, from Popper's perspective. Criticism cannot be systematized in any but the pedestrian sense of applying a systematic methodology. Systematization by the requirement of a belief in a pre-established "law" of historical or social change begs the question of a systematic investigation into this change. Methodologies may not be erected into philosophical principles or general laws, and, conversely, general laws cannot serve us a methods of inquiry. Popper accuses Marx of treating singular events and developmental trends as if they were universal laws of nature, and of then requiring that these laws function as unquestionable frameworks within which investigation may proceed. As we have seen, this is bad science on both counts.

Experimentation

There remains to be considered the anti-historicist objection to experimentation in the manner of natural science: that social events are unique. The ability to experiment and repeat experiments requires the ability to set up conditions for the experiment which are similar to past conditions. The historicist claims that in a social context this simply cannot be done. Popper is not impressed with this argument. The question of whether or not social events have the necessary reproducibility for experimentation is one which should be left up to the experimental method itself:

It is impossible to decide a priori about any observed difference or similarity, however striking, whether or not it will be relevant for the purpose of reproducing an experiment. So we must allow the experimental method to take care of itself. (Popper, 1964: 94)

The argument of the historicist can be reduced ad absurdum. All that need be done is to note that it is never the case that any experiment exactly duplicates the contextual conditions of any other experiment. Therefore, even within the natural sciences, the

possibility of using experimental method must be denied. The fact of the matter is that it is not necessary to be able to duplicate precisely all experimental conditions. Indeed, if it were necessary, experimentation would have no point, for experimental results could not yield any transferrable information -- we could not generalize. It is only necessary to replicate relevant conditions, often in a relatively imprecise way, and this relevance can only be determined subsequent to the experiment itself. Knowing this, the argument that social experiments are seriously hampered by the variability of social conditions loses much of its force.

The reader may object that there may still be some problem with the sui generis nature of events in general, not just social events but also physical events. For those who would base scientific progress on the use of an inductive method, such an interpretation of reality would preclude the necessary generalization, and scientific progress would be impossible. For a falsificationist such as Popper, however, such an interpretation would not prevent the generation of universal hypotheses, since this is accomplished independently of observation. All such hypotheses would naturally be falsified, but such

falsification would actually indicate progress. In any case, the problem is not one which can be solved by a choice of method -- it lies outside the reach of scientific method, as we have seen. It may only be understood as a metaphysical matter or as a problem of conventional agreement, as it is treated by Popper.

Nor is Popper impressed by the historicist observation that all generalization can proceed no further than the bounds of a particular historical period. Even spectacular differences between historical periods can give no support to the idea that laws bridging historical periods cannot be found "any more than the spectacular differences between Greenland and Crete can prove that there are no physical laws which hold for both regions." (Popper, 1964: 101) Yet there may be differences in history which are more fundamental than those in the physical realm. The historicist often claims, after all, that human nature itself is bound up in the character of an historical period. If society changes radically from one period to another, perhaps man changes, too. Popper responds to this by noting that atoms, too, change with their environment, for example under the influence of magnetic fields, and that this change occurs not in defiance of the laws of physics, but according to them.

Furthermore, the significance of any alleged change in human nature is doubtful, and very hard to ascertain. Indeed, we may ask how the very occurrence of this change is to be proved at all. For if we were to admit that laws are subject to change from one period to another, this change could not itself be explained by a law. In Popper's words, it would be the admission that the change was just "miraculous". This would be the end of any progress in knowledge, because any unexpected observations would not cause us to revise our theories. All that would be necessary to "explain" them would be the adoption of an ad hoc hypothesis that the laws had changed. (Popper, 1964: 103) Again, we would violate the rules of the game.

Criticism of the Pro-Naturalistic Doctrine

Popper has stated that the central tenet of both the anti-naturalistic and pro-naturalistic varieties of historicism is that there are general laws of historical development which are discoverable by human beings. "The belief, more especially, that it is the task of the social sciences to lay bare the law of evolution of society in order to foretell its future ... might be perhaps described as the central

historicist doctrine." (Popper, 1964: 106) The anti-naturalistic historicist believes in a distinction between the unchanging natural and the changing social world, while the pro-naturalistic historicist believes that there can be social laws of succession on the order of the natural law of evolution.

But Popper shows that the pro-naturalistic position is based upon a misunderstanding of the so-called "law of evolution". This misunderstanding is related to the distinction between strictly universal and numerically universal statements. All laws of nature are hypotheses, but this does not mean that all hypotheses are laws, in the strict universal sense. The "law of evolution" is of course an hypothesis, but it is the type of hypothesis which has the character of a specific or particular historical statement. Popper likens this to the statement that "Charles Darwin and Frances Galton had a common grandfather." (Popper, 1964: 107) There cannot be a law of evolution in the strictly universal sense, because the evolution of life on earth, or of human society, or of history, or of any process is a unique, historical event. It may proceed according to all kinds of laws, but the description of this process is itself not a law, only a singular statement. Evolution is, after all, about life on

earth. It does not generalize its principles to all points in space, or all times. There may be other life forms someplace else in the universe, which may or may not have evolved in a similar fashion to those on earth, and our "law of evolution" does not speak to that. The discovery on some distant planet of a life form which did not evolve would not disprove the law of evolution on Earth, but the discovery of light which travelled at sixty miles an hour in a vacuum somewhere else in the universe would disprove the law of the constancy of the speed of light. Nor does the law of evolution speak to the problem of evolution ending sometime in the future, or of it ever having had a beginning. Because the hypothesis of evolution has the character of universality, but is bounded by inclusion of an individual concept (the Earth), it loses its strict universality, becoming a numerically universal statement, and cannot be considered a natural law. The "law" of evolution is not a law, it is the description of an historical event here on Earth, and a unique one at that. Since it is unique, it cannot be tested.

Now it is possible to argue against the uniqueness of historical evolution and in favor of its testability. The historicist could, in the first place, simply deny the uniqueness, citing, for example,

civilizational life-cycles, showing apparent similarities in the rise and fall of civilizations, as both Spengler (1926) and Toynbee (1961) have done. (9) But Popper would reply that these apparent similarities are only that. They are apparent and they are vaguely similar, but they are not exact repetitions of historical events, nor can they ever be. (10)

Secondly, the historicist can claim that even if we accept the uniqueness of events, we can still detect trends as characteristic of a unique event. Social systems are dynamic and in motion, just like physical systems, says the pro-naturalist, and since we can generalize about physical systems, there is nothing to prevent us from generalizing about social systems. But Popper says that this claim is based upon a confusion of statics and dynamics. A dynamic system for the physicist is really analogous to a system which a social scientist would call "static". An example of a dynamic system for the physicist would be the solar system: it is not evolutionary, and this very characteristic is what permits us to generate predictions about it. It is therefore a mistake to suppose that these dynamical long-term predictions establish the possibility of making general predictions about non-stationary social systems. (Popper, 1964:

113) The difference is clear when we note that in natural science, when speaking of motion, we are dealing with the change in position of one thing relative to another. But the historicist social scientist, when speaking of the movement of a system, seems really to mean actual internal structural change of the system itself. (11)

Still, Popper admits that it seems true that we can document certain trends statistically. But again, trends are not laws. The assumption of trends is often a useful statistical device, but any statement which asserts the existence of a trend remains existential, and not strictly universal:

... a statement asserting the existence of a trend at a certain time and place would be a singular historical statement, not a universal law. The practical significance of this logical situation is considerable: while we may base scientific predictions on laws, we cannot (as every cautious statistician knows) base them merely on the existence of trends. A trend (we may ... take population growth as an example) which has persisted for hundreds or even thousands of years may change within a decade, or even more rapidly than that. (Popper, 1964: 115)

Even in the physical sciences, we do not make predictions on the basis of trends. We may assume that any succession of phenomena proceeds according to universal laws of nature, but it is important to note

that "no sequence of, say, three or more causally connected concrete events proceeds according to any single law of nature." (Popper, 1964: 117) Thus the succession of physical phenomena is not itself a universal law, but is explained through the use of a series, perhaps infinite, of interactions which are themselves based upon universal laws. The wind shaking a tree, and an apple falling to the ground, cannot be described by any one law, nor even any definite set of laws. The idea that any sequence or succession of events can be described by any one law is simply mistaken: "There are neither laws of succession, nor laws of evolution" in natural science, social science, or anywhere else. (Popper, 1964: 117)

Causality in History

The cause of an event is the conjunction of some covering law and some specific initial conditions, and the event can be said to be an effect of this law and these conditions. Popper makes the point that we can never speak of cause and effect in any absolute sense. We must say that an event (the initial condition) is the cause of another event only in relation to some universal law. Since the use of a theory for

predicting an event is the same as its use for explaining the event, we cannot legitimately predict events without also referring to some universal law. The failure to recognize this fact is, according to Popper, "the central mistake of historicism". (Popper, 1964: 128) The laws of development of historicism have been shown to be nothing more than trends, and as trends, can only have the character of numerically universal (which is to say existential or singular) statements. They cannot be treated as strictly universal covering laws, and hence the predictions which the historicists make based upon these trends are not scientific predictions at all, but can only be in the form of prophecies. (12)

To be sure, explained trends do exist. Since trends are unique singular events, they can be explained, but any persistence in trends depends upon the persistence of other specific initial conditions, which may in turn be trends. The historicist who disregards this, and deals with trends as if they were universal laws, cannot make use of the covering law model of scientific explanation. It is very easy to make this mistake, and to overlook the initial conditions, and the dependence upon them of general trends. The Marxist trend of "the accumulation of the

means of production" may, for example, depend upon such things as inventions, population parameters, and the psychological impact of an industrial environment. (13) We must try to imagine the effect on the trend if the initial conditions were not there. This is just what the historicist cannot do, since all his eggs are already in one basket:

The poverty of historicism, we might say, is a poverty of imagination. The historicist continuously upbraids those who cannot imagine a change in their little world; yet it seems that the historicist is himself deficient in imagination, for he cannot imagine a change in the conditions of change. (Popper, 1964: 130)

The pro-naturalistic historicist is mistaken about the methods of natural science, and hence about their use in social science. But his heart is in the right place, because although the methods of natural and social science differ slightly, they are nevertheless basically the same: "the methods always consist in offering deductive causal explanations, and in testing (by way of predictions)." (Popper, 1964: 131) The covering law model of scientific progress is indeed a covering model, for it covers all forms of scientific investigation, as well as all forms of rational investigation period.

There are some differences between the natural sciences and the social sciences which Popper is willing to accept, however. First of all, an inability to quantify the objects of his study has always been a thorn in the side of the social scientist. Now the natural scientist has this problem too, although to a lesser extent, as we can see in Popper's treatment of the statistical basis of many observations in natural science. (14) But in the social sciences, this difficulty has at times proven to be almost insurmountable. It has been overcome in part through the use of advanced statistical analysis, but there nevertheless remain some severe and fundamental problems. In social science, the parameters with which we often deal have a tendency to change greatly and rapidly and this often obviates the possibility of using statistical analysis as a basis for research. Additionally, most of the interesting phenomena studied in social science can only be studied at a relatively rudimentary statistical level, unless we violate fundamental statistical assumptions. (15)

Secondly, the historicist has a point when he makes the claim that the objects of study in social science are fundamentally different than those of physics. They always boil down to individual human

beings. This leads to an approach to the study of social reality which Popper refers to as "methodological individualism" (more fully developed in Chapter 5). Individuals can be studied, unlike physical objects, by making the assumption of rationality on the part of the object of study. Popper calls the method which makes use of this assumption the "zero method":

By this I mean the method of constructing a model on the assumption of complete rationality (and perhaps also on the assumption of complete information) on the part of all the individuals concerned, and of estimating the deviation of the actual behaviour of people from the model behaviour, using the latter as a kind of zero coordinate. (Popper, 1964: 141)

The zero method is often employed by social scientists (see for example Rawls, 1971; and Friedman, 1953). It is basically the same as Weber's "ideal types" (1968a). Indeed, the assumption of a rational model of political behavior and the examination of actual political behavior as deviations from the zero order assumption is a technique which is as old as Plato. Announcing the zero order assumption amounts to a description of what the social scientist believes to be rational behavior, and this assumption is of course based upon experientially derived knowledge of the psychological

characteristics of human beings.

But this does not imply that there is a psychological basis for all social science; psychology is simply one among many social sciences:

In fact, psychology cannot be the basis of social science. First, because it is itself just one of the social sciences: "human nature" varies considerably with the social institutions, and its study therefore presupposes an understanding of these institutions. Secondly, because the social sciences are largely concerned with the unintended consequences, or repercussions, of human actions [sic]. (Popper, 1964: 158, my emphasis)

The reductionist contention that sociology is simply the study of psychological characteristics cannot be successful because of the fact that human actions have unintended consequences, important ones. Now a strictly doctrinaire Freudian may attempt to overcome this objection with the assertion that there are no unintended consequences, and that all consequences of our actions are at least subconsciously intended. But in the first place, such an assertion is impossible to falsify, and thus remains unscientific or "metaphysical", to use Popper's words. And furthermore, if we maintain that human actors behave in a context of incomplete knowledge, an assumption which is not at all metaphysically untenable and which is

practically fruitful, then we cannot assign to any human actor the ability to know all potential consequences of any specific action, even "subconsciously". For in a deterministic context, the consequences of a particular action must ripple infinitely through time, requiring, therefore, complete knowledge of the future, while in an indeterministic context, there may occur at some point events which cannot be assigned specific causes, and which therefore cannot be incorporated into the knowledge of all potential consequences of a human action. Besides, there exist some consequences of human activity, such as those outlined in the Tragedy of the Commons problem (Hardin, 1964) and studied extensively in contemporary Public Choice Theory (Buchanan and Tullock, 1962; Olson, 1971), which are not the direct result of conscious or unconscious human intent, but are rather the result of the conjoining of this intent with certain characteristics of the physical world. And human intent cannot, no matter how hard it tries, change the fundamental constraints imposed upon it by the physical world. We may invent airplanes, but they must still obey the law of gravity.

The uncertain consequences of human intentions causes Popper, in place of reducing sociology to

psychology, to claim instead that the human factor is "the ultimately uncertain and wayward element in social life and in all social institutions." (Popper, 1964: 158) In fact, it is the human element which cannot be completely controlled, for any attempt to do so must lead to tyranny, and if the tyrannizing individual is himself a human being, subject to the uncertain elements of human psychology, the problem yet remains, as Hobbes has shown in his famous paradox.

Yet there is room for certain psychological assumptions about rationality in the study of society, as we have seen. For Popper, this zero order assumption is best expressed in the so-called "logic of the situation". (16) To see Popper's place for situational logic in a scientific study of society, let us first examine his distinction between theoretical and historical investigation a little more closely.

Remember that true science is theoretical science, and as such it is characterized by its interest in universal laws, and by its deductive method of falsification. History, on the other hand, "is characterized by its interest in actual, singular, or specific events, rather than in laws or generalizations." (Popper, 1964: 143) These singular events include trends and, to be sure, to the extent

that the historian attempts to explain these trends and events, he will have to make use of theoretical sciences which concern themselves with universal laws. But the historian is not interested in these laws as an historian; he is instead interested in the event. For example, the interest shown by some evolutionists and historicists in questions of the origins of man or society, is really an interest in "how and why" questions. These questions are comparatively unimportant theoretically, in that they do not and cannot lead to the formulation of general laws. They describe singular events, and are usually only of specific historical interest. Popper does not here mean to denigrate historical investigation or to trivialize the findings of historians. Rather, he merely wishes to show that history and social science, while linked in the study of humankind, are nevertheless two distinct modes of investigation, characterized by separate methodologies and separate problems. History's interest in singular events cannot approach the theoretical, because describing a singular event means emphasizing that event's peculiarity and uniqueness. This is necessarily to include aspects of that event which do not attempt to explain it causally. The two tasks of social scientific and historical

investigation are related, necessary, and complementary, and any event in history can be viewed under either perspective, but they are not to be conflated and confused with each other.

If there cannot be historical theories, can there yet be a theory of history? I suspect that Popper would find that this would be impossible, for any theory that attempted to describe historical investigation would be describing a singular event and would fall prey to several problems: (1) by describing a singular event, it would not be dealing with universal laws; and (2) the event of studying history occurs within history, as does the event of theorizing about the study of history, which brings us back to the Oedipus effect. We should note, however, that the first objection can be raised against a "theory" of scientific discovery, too -- which is why Popper can deal only with the "logic" of scientific discovery, and cannot formulate laws to explain the phenomenon.

The Myth of the Framework

The anti-naturalist has made the claim that the peculiar character of social laws binds them to particular historical periods, while the pro-naturalist

purports to discover "laws of history" which extend beyond these periods. Popper has argued against both of these: against the first on the grounds that it produces utopianism and totalitarianism, and against the second by showing that it relies on a misunderstanding of the nature of scientific laws and historical events. There is one claim which at least the anti-naturalistic historicist can make against all this. Even if Popper can show that human nature is not bound by a particular historical epoch, it may be the case that human knowledge is so bound. This stand leads to epistemological relativism, and Popper rejects it out of hand, but Burleigh Taylor Wilkins (1978) has a number of interesting things to say about Popper's argument.

The basic argument which Wilkins advances against Popper revolves around what Wilkins refers to as Popper's "Myth of the Framework". Wilkins' work, Has History Any Meaning?, takes its title from a concluding chapter in Popper's The Open Society and Its Enemies (1966b), and Wilkins concentrates most of his attention on the ideas of Popper which are expressed in this chapter. Popper adjudges epistemological relativism to be based upon the "myth of the framework": the idea, that is, that all knowledge statements are

fundamentally encapsulated in a "framework" of ideas which we acquire, innately as it were, through our cultural, social, and intellectual heritage. This idea is of course nothing new, and there is nothing necessarily illegitimate about it. Carl Becker's (1932) "Climate of Opinion", for example, is one of the more precise and cogent presentations of this theme, and Thomas Kuhn's (1970) claims regarding paradigmatic revolutions in science also make use of a restrictive interpretation of framework. But the "framework mythologists" infer from all this a radical imprisonment of the individual intellect within this framework. As it is impossible to escape operating from within a framework, standards of truth and knowledge must be beyond our reach. The only legitimate epistemological (and, by the way, moral) standpoint is one of a thoroughgoing relativism.

Popper rejects this, noting in a rather famous passage:

... at any moment we are prisoners caught in the framework of our theories; our expectations; our past experiences; our language. But we are prisoners in a Pickwickian sense: if we try, we can break out of our framework at any time. Admittedly, we shall find ourselves again in a framework, but it will be a better and roomier one; and we can at any moment break out of it again. (17)

Wilkins is not happy with this formulation, however, for he believes that this statement of Popper's attitude towards science directly contradicts Popper's declaration of the importance of interpretation for historical research, what Wilkins calls Popper's "Third Thesis".

According to Wilkins, Popper has three theses in mind in dealing with the logic of historical inquiry:

(1) First of all, the study of history is always characterized by its interest in singular or specific events, and not by any interest in universal laws or generalizations.

(2) Secondly, Popper endorses the "covering law" model of historical explanation, but emphasizes that any use of universal laws by historians is usually unimportant, even trivial, and these covering laws are never used as a means to test a specific hypothesis.

(3) Finally, Popper argues that history must be selective "unless it is to be choked by a flood of poor and unrelated material." (18)

Let us deal with Wilkins' criticisms of these three theses one at a time.

History and Singular Events

Wilkins agrees that it is true that historians are concerned with specific singular events, but he does not think that this specificity is limited in the way

in which Popper would maintain. He is willing to grant to historians much greater latitude in their topics of investigation than is Popper, noting at one point that if Hegel did nothing else for us, he at least has made us sensitive "to the great variety of interests and points of view among historians." (Wilkins, 1978: 24) Therefore, we must be very wary of sweeping characterizations of "what historians do".

The singular events in which historians are interested are often extraordinarily complicated, and Wilkins wonders whether it is at all valuable to continue to characterize them as singular events. For example,

In my judgment to characterize events so complex as either the Peloponnesian Wars or the development of Britain as being singular or specific would be informative only as a way of telling us that historians are not concerned with wars or nations in general but only with particular wars or nations. (Wilkins, 1978: 25)

If we overemphasize the singular nature of historical events, we will have a tendency to downgrade legitimate historical inquiry into more general considerations, especially "the causal connections among any events which usually make up the problem or the 'whole' that the historian investigates." (Wilkins, 1978: 25)

But this argument can be of no use against Popper, for we have already seen his own argument against analyzing the "whole" (in the sense of "totality") of anything. Wilkins seems to overlook this, as well as the distinction which Popper makes between strictly universal and numerically universal statements. No matter how many wars we observe, any factors common to these wars can only be expressed as a numerically universal statement. It remains a conjunction of singular statements. We may try to avoid this by making a statement such as "War is caused by class struggle" and intend it in its strictly universal sense. We could then at least conceivably test it by attempting to falsify it through critical observation and experiment. If we did all this, I believe Popper would grant us the status of scientists, specifically military or political scientists. But he would not admit that we were being historians. For all history is the history of something, and therefore we must refer to some object of investigation other than simply "war" in general. If we are writing a history of human society, then we will be dealing with human war, and the statement cannot be considered strictly universal.

The Triviality of Covering Laws in History

Wilkins says that Popper does not deny the presence of general considerations in historical inquiry but that he "downgrades them unduly" by his second thesis. The primary difficulty with this thesis, according to Wilkins, is its ambiguity: "Is he simply describing the limitations of many histories, or is he saying that history as a kind of inquiry necessarily has these limitations?" (Wilkins, 1978: 26) If Popper is simply describing limitations of histories which have been written, this does not prove the impossibility of writing a history which does not contain these limitations, and if Popper is maintaining that history as a kind of inquiry has these limitations built into it, then Wilkins believes that Popper has in no way shown this to be the case.

But once we understand Popper's intention of "general statements" as being statements containing strictly universal terms and only universal quantifiers, Wilkins' objection to Popper's second thesis is again not so strong, for the ambiguity in Popper's position is removed. It is clear that what Popper is saying is that history as a whole cannot in principle be understood in universal terms. This is so

owing to the open-ended nature of history, extending as it does indefinitely into the future. We must limit ourselves to a "logic of the situation" by which we generalize only to the boundaries of a situational context which occurs within the general context of history. Whole statements such as these might appear to bear the form of universal statements, but, strictly speaking, they are not. Again, "War is the result of class struggle" is a meaningful statement in a limited context (whether or not it is true is beside the point), that is, a context which surrounds it with limiting statements such as "in our recorded knowledge"; "up until the present"; "here on Earth"; or "discounting natural disasters". These statements place the "universal" statement in an existential context, thereby depriving it of its universality. It remains "universal" within a specific context, and retains the appearance of an hypothesis, but it loses its ability to behave as a strictly universal statement about history qua history, and at this level, it is not falsifiable.

The Need for Interpretation in History

The problem with Popper's third thesis, that of the need for historical interpretation, is not that it is fundamentally wrong, but that, according to Wilkins, it does not seem to be a means of delineating theoretical from historical investigation. It is clear that Popper recognizes something of the problem of the framework in scientific investigation. We have already seen Popper's disdain for the "naive empiricist" who "thinks that we begin by collecting and arranging our experiences, and so ascend the ladder of science" (Popper, 1968: 106) We have noted that such an approach is in the first place not possible, for it ignores the problem of filtering perceptions and observations according to some relevant basis. We simply cannot observe without such a filter, and the filter which Popper suggests we utilize is one which pays attention to the common problems, theories, and traditions of contemporary science -- a "framework", in other words. We may not be bound by this or that particular framework, but we must choose one in order for investigation to proceed. The idea that the pursuit is dependent in some sense upon the choice of a perspective bothers Wilkins a great deal, and he asks,

Can Popper give us good reasons to believe that interpretation is more central or basic to historical inquiry than to scientific inquiry? If he cannot, this would indicate the presence of a paradox in his philosophy. (Wilkins, 1978: 27)

The paradox to which Wilkins alludes is the fact that Popper seems at once to be an enemy of the "myth of the framework" and yet seems to defend it where the writing of history is concerned. Historical interpretations are frameworks, or at least the results of frameworks. Since Popper says that in science we can leap from one framework to another, we ought to be able to do so in history also. But Popper never denies this possibility. What he denies is the possibility of testing the truth of any framework, and this is denied both for historical investigation and for scientific investigation.

Wilkins is unclear at times in his use of the term "framework". At one point he seems to mean that frameworks are the sum of the cultural, social, and intellectual heritage which the historian brings to bear upon his work, and this is certainly what Popper means. At other times, however, Wilkins uses the term as if to mean those problems which give the historian his incentive to inquire. Popper distinguishes between

these two uses, but it is clear that they are related. The cultural and intellectual framework which creates the context for the historian's investigation contains some of the problems which the historian wishes to investigate, and this is also true for the scientist. But it is important to keep the framework separate from the problems, because the specific problem which the investigator addresses may be the framework itself. We would never experience the need or desire to move from one framework or perspective to another if we did not, at some time, have problems generated from operating within the framework. This is the point of Kuhn's "revolutionary science" after all. (Kuhn, 1970) We may replace the notion of a framework in history with Kuhn's concept of a paradigm in science and say that when the acceptance of a paradigm and operation within a paradigm becomes itself problematic, by producing too many results which seem to conflict with the paradigm and with each other, a search for a new paradigm begins.

But this slight confusion on Wilkins' part is not all that dramatic. For his point can be made simply by appealing to Popper's notion of problems being the "spur to research" and talking instead then about the "myth of the problem". We could then say that the

historian's interpretation will of necessity be based upon and generated by the particular problems with which he is concerned. This is also true of the scientist. However, this is not at all the same thing as making an argument in favor of epistemological relativism. It is an argument instead about human motivation, and about fruitful modes of inquiry, rather than about the possibility of knowing. When dealing at this level, the level of problems, Popper can continue to maintain his distinction between historical and theoretical investigation. The problems generated for the theoretician are problems brought about by the momentary acceptance of a bold hypothesis or of a general law, while the problems of the historian are problems generated by the singular events of history. As we have seen, no singular event, no matter how complex its description may be, can be managed like a universal law. We can construct no argument which would produce conclusions in the form of distinct singular statements which would allow us to test the original perspective.

The Problem of Meaning

Wilkins comments on Popper's claim that history

can have "no meaning" (Popper, 1966a, II: chap. 25) by referring us to the work of W. H. Walsh (1959). First of all, Walsh notes that we must distinguish between the question of whether we can discover meaning in history and the question of whether there is any possible meaning of history to be discovered. It is possible, says Walsh, to be concerned with discovering meaning in history:

Just as the fact that a scientist succeeds in understanding a set of previously puzzling phenomena is without relevance to the thesis that we can make sense of nature as a whole, so is the historian's activity of establishing order in his material irrelevant to the question of whether a pattern can be discerned in history. (Walsh, 1959: 229)

The historian is entitled to arrange the objects of his investigation and his results into an order which makes some sort of sense, and Popper is in accord with this. Popper sees the value of historical interpretation as a means of solving particular historical and social problems. We can write histories of industrial development, histories of war, and indeed even a history of "international crime". (Popper, 1966b, II: 270) There is nothing wrong with this, and to the extent that the historian is successful in elucidating such histories, he may legitimately be considered to

have found some meaning in history.

But this is not the same thing as science (which holds no monopoly on meaning) and it is furthermore not the same as a meaning of history. Walsh sees two distinct ways of inquiring into this latter type of meaning. The first, more modest of the two, involves searching for regular laws or patterns (what Popper would call "trends") which appear to govern historical change. The second form, however, involves a search for "a single plot or pattern in the whole course of historical development ... history makes sense only if the goal in question is something of which we can morally approve." (Walsh, 1959: 303) The difference between the two is that the first approach does not entail the second. For patterns within history again involve the description of singular events, such as the description of the evolutionary process. It is a great leap to move from the description of this event to the declaration that it is the one single law which encompasses and explains all historical change, and which therefore gives history its meaning. Walsh notes that to the extent that this is done, we often end up in the position of predicting the end of history and of morally evaluating this end. If we approve of the foreknown end of history, we might then speak of the

"progress" of history. On the other hand, if it turns out that the end does not meet our approval, we may speak instead of a "decline" in history.

Moreover, historicism goes even further than describing the historical process as being moral or immoral:

... it seeks not only to tell us where we are going and that where we are going is a morally desirable goal or end, but it also seeks to derive moral imperatives from the allegedly factual claim that history is going in a certain direction. In short, historicism tells us that the goal or end toward which history is moving is morally desirable because history is moving toward that goal or end. (Wilkins, 1958: 22)

We have already seen Popper's arguments against the "moral historicism" of the utopianists and holists. (19) But Walsh's distinction between the two types of meaning of history means for him that such moral overtones need not be present in any inquiry into the laws of historical change. Rather, these laws can be discovered in a strictly scientific manner. (Walsh, 1959: 304) Wilkins agrees with this. He believes that Walsh is correct in stating that the first sort of inquiry can, if successful, find certain laws of history, without at the same time obliging us to comment on where history is going, or whether the ends

of history are morally desirable. (Wilkins, 1978: 18) This is so because, for Wilkins, "all a law tells us is that under certain conditions certain events will --- or will not --- occur, and the question whether these conditions obtain is a separate matter." (Wilkins, 1978: 18)

But none of this meets Popper's basic objection. The notion that we can discern within history general laws which have the quality of being able to generate predictions, even if we do not at the same time make some statement about the overall goal or end of history, is precisely the confusion between trends, in the form of hypotheses, and strictly universal laws, which are the only truly scientific form of hypotheses. Popper has detailed this confusion earlier, and as we have seen, historical trends can never in principle be treated as universal laws, because any historical trends remain descriptions of life on Earth, and therefore contain singular limitations in the form of individual concepts.

The Call of Historicism

Popper toys with the idea that even though historicism is not science, it nevertheless seems to

answer some sort of need. It attempts to explain and understand things about which human beings are genuinely puzzled, and he says that before we can get rid of historicism, we have to be able to offer something better to take its place, something which would adequately satisfy these needs.

Popper is alluding to a very serious problem here. There are some good points to historicism. It is, for example, often a reaction against the "naive method of interpreting political history merely as the story of great tyrants and great generals." (Popper, 1964: 148) Historicists feel that there must be something better than this type of explanation, because it links historical progress simply to human personalities, and if personalities are the result of chance evolutionary and environmental factors, what meaning could there be in history? Instead, the historicist tends to replace the tyrants and generals with "spirits" and "consciousnesses" (every bit as tyrannical, though): the "spirit" of an age, of a nation, of history itself. It is clear from the above discussion that Popper has no sympathy with these spirits:

And yet I feel that they indicate, at least, the existence of a lacuna, of a place which it is the task of sociology to fill with something more sensible, such as an analysis

of problems arising within a tradition. There is room for a more detailed analysis of the logic of situations. (Popper, 1964: 149)

Situational logic, perhaps using Popper's zero method, can explain, as Jarvie (1972) shows, the reasons for an event occurring. But as both Popper and Jarvie wish to point out, this is not all there is to the explanation of social phenomena. We need something more, something on the order of an analysis of social movements and social institutions. These studies should be based on methodological individualism, says Popper, and they may penetrate through current institutions, to the ways in which new traditions and institutions may be created, and to the ways in which old ones decay and die.

With all this said, however, there yet remains the problem of the emotional appeal of historicism. There is a certain satisfaction to be gained in the theoretical sciences. If we cannot know general laws to be true, at least we can know what laws are false, and this knowledge is not of inconsiderable value. In addition, there is a certain aesthetic satisfaction to be derived from the practice of theoretical science. The elegance of certain mathematical formulae and the beauty of the "truth content" of some universal laws are widely recognized. The problem is that in history,

the universal laws which can be used are for the most part trivial and used unconsciously; they cannot possibly fulfill the function of interest-and aesthetic satisfaction as we find in theoretical science. To the charge that historicism turns out to be unscientific, anyone convinced of the validity of that charge, even an historicist, can quite legitimately respond "So what?" Perhaps the purpose of historicism is not to do the deeds of science after all, but to fulfill some need which science is perceived as not fulfilling. And perhaps science is not the only way of knowing, but only one among others. Furthermore, Popper's charge that historicism as a means of investigation is unfruitful in that it does not generate the knowledge which is utilizable by the politician for the construction of a better social order, may miss the point in this regard. This might only be one aim of the historicist; there might be other more deeply-set, even psychological aims, which Popper does not address.

In fact, Popper notes, at the end of his 1964 work, that there is a great emotional appeal to historicism. It seems to fulfill some emotional need in human beings; a need which Popper sees present throughout history. Popper therefore points out that historicism is not a modern phenomenon, but very, very

old. The final passage of his 1964 work is worth quoting in full here:

To present so venerable an idea as bold and revolutionary is, I think, to betray an unconscious conservatism; and we who contemplate this great enthusiasm for change may well wonder whether it is not only one side of an ambivalent attitude, and whether there was not some inner resistance, equally great, to be overcome. If so, this would explain the religious fervour with which this antique and tottering philosophy is proclaimed the latest and thus the greatest revelation of science. May it not, after all, be the historicists who are afraid of change: And is it not, perhaps, this fear of change which makes them so utterly incapable of reacting rationally to criticism, and which makes others so responsive to their teaching? It almost looks as if historicists were trying to compensate themselves for the loss of an unchanging world by clinging to the faith that change can be foreseen because it is ruled by an unchanging law. (Popper, 1964: 160-161, my emphasis)

If historicism is unscientific, and if it furthermore is unfruitful for planning social reform, perhaps the "emotional appeal" is the only thing that is left. Only at this point in his work does Popper seem to glimpse the "pneumopathological" aspects of what Voegelin will later maintain to be the historicist "revolt against reason", and the preference for "certain untruth" over "uncertain truth". (Voegelin, 1968)

(1) Kant, Dreams of a Ghost Seer, Part II, Chapter III; in Werke, E. Cassirer, ed., vol. II, p. 385; quoted in Popper, 1964: 56.

(2) Popper notes Hayek's objection (Cf. Collectivist Economic Planning, 1935: 210) to the use of the term "social engineering" as requiring the centralization of all relevant knowledge in a single head. Popper says that this very idea could be known in the form of a technological hypothesis of which the piecemeal engineer is aware. In other words, the engineer could know that "it is not possible for all relevant knowledge to be centered in a single head" and would take this into account in his engineering.

(3) (Popper, 1964: 66) The sociological principle that the efficiency of institutional machines is limited (see above aphorism) can be compared with the principles of thermodynamics, which exclude the possibility of perpetual motion machines. Popper contrasts this with "scientistic" attempts to work out analogies between physical energy and such concepts as political power. For example, Bertrand Russell (Power, 1938: 10ff.) makes the point that the various forms of power, such as wealth, propaganda power, and physical prowess, may be converted into one another. This idea, however, is one which according to Popper cannot be expressed in a technological form. This would indicate that for Popper the ability to formulate such an expression is a test against scientism.

(4) We must note here, however, that Popper's refutation of dialectic depends upon the assertion of his own interpretation of the progress of human knowledge, and this assertion has thus far been left in a state of "suspended animation" by his doctrine of conventionalism.

(5) See for example the Manifesto's criticism of "Critical-Utopian Socialism and Communism" as "fantastic pictures of future society", lacking "all practical value and all theoretical justification", their proponents differing from reactionary conservatives "only by more systematic pedantry, and by their fanatical and superstitious belief in the miraculous effects of their social science." (Marx and Engels, 1978: 489-499)

(6) It is in fact impossible, as seen in note 2

above.

(7) See in this regard the excellent treatment of Lysenkoism by Medvedev (1969), and by Cole (1983).

(8) The notion that Marx's analysis was inspired by his moral indignation over the shoddy treatment of the proletariat is part of the popular mythology about Marx. Generally, the idea is advanced by those who might reject the consequences of Marxism, but who, wishing to find some good in it all, are willing to maintain that Marx's heart, at least, was in the right place -- though he may have gone overboard a bit owing to his highly-developed moral sensibilities.

Such an attitude fails for two reasons. (1) Marx explicitly condemns the sentimentality proposed by such a view, and (2) as Niemeyer (1971) shows, Marx's critique of society was already in place by the time he "discovered" the proletariat. Why Popper falls victim to this myth is a mystery.

(9) Interestingly, Voegelin criticizes this type of thinking in a manner which would appear pleasing to Popper. He writes:

The cycle of political forms ... has remained a problem in the theory of history and politics through the ages. It will be sufficient to recall the names of Aristotle, Polybius, Machiavelli, Vico, Spengler, and Toynbee. None of the sequences evolved by the various thinkers can be called satisfactory, though all of them have absorbed a sufficient amount of historical materials to prove that the problem is not in vain. (Voegelin, 1957a: 128)

The problem with such investigation is that it relies upon an attempt to "construct the pattern by an inductive method that would generalize historical observations" (Voegelin, 1957a: 128) Such induction is impossible, as Voegelin shows in his admirable analysis of Toynbee (Voegelin, 1975: esp. 1-11), precisely because the "framework" used to select the relevant historical facts is quite simply the resultant generalization: the life-cycle hypothesis

itself.

(10) Nietzsche's doctrine of the "Eternal Return of the Same" comes to mind here. His primary argument in favor of the doctrine is to be found in Thus Spoke Zarathustra (Nietzsche, 1968: 103-439) in Section III, Part 2:

"Behold," I continued, "this Moment! From this gateway, Moment, a long, eternal lane leads backward: behind us lies an eternity. Must not whatever can walk have walked on this lane before? Must not whatever can happen have happened, have been done, have passed by before? And if everything has been there before --- what do you think, dwarf, of this moment? Must not this gateway too have been there before? And are not all things knotted together so firmly that this moment draws after it all that is to come? Therefore --- itself too? For whatever can walk --- in this long land out there too, it must walk once more. (Nietzsche, 1968: 270)

Zarathustra is the story of finding out about this doctrine, of learning to live with it and by it. The argument essentially breaks down into five parts:

1. Every particular thing in the world is causally determined to exist and to be what and as it is.

2. In the infinity and eternity of time past and present, all things that can exist have existed, and have been determined to exist.

3. Just as the past determines the present, so the past and present together determine the future.

4. But if all the things which can exist have existed in the past or exist still in the present, then the future can bring only a continuation of the things which now are, or a return of those which have been.

5. The history of the world, therefore, can be nothing but the "eternal return of the same".

The argument has an acceptable logical structure, and therefore it is valid. But, as we all know, there

is a distinction to be noted between a valid and a sound argument. Validity is not enough. Arguments must contain premises which are true in order for them to generate true conclusions. Nietzsche's argument is dependent upon the truth of the following propositions:

1. that there has been an infinity of time in the past.

2. that there is only a finite stock of things so that all things capable of existing have already done so. Or, more precisely, if there is to be an infinite number of events possible, the infinity of time must be of a greater magnitude. If events are denumerable, time must be superdenumerable. If the infinity of time is not greater than the infinity of objects and events, then we would not be capable of knowing that "infinity plus one equals origin".

3. that there will be an infinity of time in the future. If this were not so, there may be a final state.

4. that there is complete causal determinism ("hard"); that there are no things which happen without causes.

Any of these propositions may be criticized.

(11) Additionally, we may note that the ability to deal with interactions and predictions in even so "precise" a science as physics may prove to be extraordinarily difficult, as is seen in the intractability of the three-body problem in gravitational mechanics.

(12) In this regard, Popper (1964: 117-119) points to Mill's attempt to discover "the law of progress: which law [must] enable us to predict future events, just as after a few terms of an infinite series in algebra we are able to detect the principle of regularity in their formation, and to predict the rest of the series to any number we please." (Mill, 1900: 633) Popper declares that Mill fails to make the necessary distinction between universal laws and specific initial conditions.

(13) It may also depend upon less immediately apparent factors such as ideology and religious belief,

as Weber (1959) has shown.

(14) See especially Popper, 1968: sections 47-42, 74, 75, and Appendices *ii-*vii; and Popper, 1983: Chapter III.

(15) Multiple regression analysis, for example, is widely used in political science, without much attention paid to the fact that valid use of the technique requires, at a minimum:

1. interval level data
2. a number of cases at least greater than the number of independent variables
3. normally distributed residuals with zero mean and constant variance (which requires an even greater number of cases)
4. partial correlation values of zero for the residuals
5. no correlation among the independent variables.

And this says nothing about additional requirements which may be needed for the simple computation of the regression coefficients.

These conditions are only rarely, if ever, met by social science data. I have personally seen them violated so badly that a computer program designed to calculate the regression coefficients simply gave up, and yet the (entirely unintelligible) results were used in a professional paper.

(16) See Jarvie (1972: Chapter I) for an excellent treatment of this concept. Jarvie (1969) also gives a fine example of the application of this method to anthropological problems.

(17) (Popper, 1970a: 50) See also Popper's work "Normal Science and Its Dangers" (Lakatos and Musgrave, eds., 1970: 56), where he attempts to refute Kuhn's notion of scientific paradigms.

(18) (Popper, 1964: 150) These claims are examined further in the next section of the

dissertation.

(19) See also the chapter entitled "Moral
Historicism" in Popper, 1966b, II.

V. HISTORICISM AS FALSE

We think of the key, each in his prison
Thinking of the key, each confirms a prison.
-- Eliot, "The Wasteland"

"Perhaps you hadn't heard that I was a
logician." -- Satan to Guido de
Montefeltro, Inferno XXVII

At this point, let us catch our breath and recapitulate what has gone before. The immediately preceding chapter has analyzed Popper's criticisms of historicism, and has shown why he believes historicism to be a poor method of social investigation. By and large, the refrain seems to be that historicism is simply unscientific, sharing none of the characteristics which Popper ascribes to science. Thus, historicism cannot, by its very nature, produce the type of knowledge which we say we are looking for in the social sciences.

Yet we have seen that it is entirely possible, as Popper recognizes, for the historicist to declare that the distinct nature of historicism as opposed to science may simply indicate historicism's greater value. Even if the historicist admitted that his methodology was unscientific, could this not be seen as a virtue? It should be clear to everyone that science

has not solved all our social problems, nor is it likely to do so. Perhaps it is the case that science is incapable of providing such solutions precisely because of the limitations of its own methodology. In this case, the charge that historicism fails to produce even its own desired results is a charge that can be hurled back in the face of the scientist. Such an attitude gives the historicist much ammunition to use against Popper, and requires as a response a different type of criticism -- one which would be based upon the idea that historicism is flatly untrue, i.e., that an historicist interpretation of reality does not, in some fundamental sense, comport with that reality.

Popper clearly understood the importance of establishing this criticism when he wrote the Preface to The Poverty of Historicism. His opening statement reads thus:

I tried to show, in The Poverty of Historicism, that historicism is a poor method -- a method which does not bear any fruit. But I did not actually refute historicism. Since then, I have succeeded in giving a refutation of historicism: I have shown that, for strictly logical reasons, it is impossible for us to predict the future course of history. (Popper, 1964: vi)

In this chapter, we will examine in detail the basis

for Popper's refutation, presented in several of his works (notably Popper 1950 and 1950a, 1973, 1979, 1982, and 1983). For the moment, however, let us be satisfied by way of introduction with Popper's own brief summary of his refutation, given in this Preface:

1. The course of human history is strongly influenced by the growth of human knowledge. (The truth of this premise must be admitted even by those who see in our ideas, including our scientific ideas, merely the by-products of material developments of some kind or other.)

2. We cannot predict, by rational or scientific methods, the future growth of our scientific knowledge....

3. We cannot, therefore, predict the future course of human history.

4. This means that we must reject the possibility of a theoretical history; that is to say, of a historical social science that would correspond to theoretical physics. There can be no scientific theory of historical development serving as a basis for historical prediction.

5. The fundamental aim of historicist methods ... is therefore misconceived; and historicism collapses. (Popper, 1964: vi-vii).

Popper states that the "decisive step" in his entire argument is statement number 2, which he translates as: "If there is such a thing as growing human knowledge, then we cannot anticipate today what we shall know only tomorrow." (Popper, 1964: vii, his

emphasis) Although he regards this point as "self-evident", he realizes that others would require that such a statement be proven. Popper's proof is based upon his understanding of the indeterministic nature of reality, and it consists, briefly, in showing that no scientific predictor, of any type, can possibly predict by its own methods its own future results. (Popper, 1964: vii) It is to Popper's analysis of indeterminism that we now turn.

Indeterminism in the Physical Sciences

In 1950, Popper published two articles in The British Journal for the Philosophy of Science (Popper, 1950 and 1950a), noting that by this time a "schism" had developed between quantum physics and classical physics. This schism revolved around the problem of predicting, with some precision, the occurrence of events in the physical world. The general thesis of quantum physics implied that certain kinds of physical events were impossible to predict, even in the presence of complete and precise information about initial conditions preceding those events. It held, on the contrary, that such events could only be circumscribed within probabilistic bounds -- we could predict the

"frequency of their occurrence under sufficiently similar conditions" (Popper, 1950: 117), but we could not precisely predict the actual occurrence of any single event. The alternative view, of classical physics, was taken to be deterministic, "in the sense that it implies the predictability, with any desired degree of precision, of every single physical event, on the basis of sufficiently precise initial information." (Popper, 1950: 117)

The quantum mechanical argument for indeterminism depends upon the actual observance of indeterministic phenomena. Indeterminism, in this view, is an empirical fact, not something to be shown logically or theoretically, although physical theory must be expected to reflect these observations. Popper's own arguments for indeterminism, however, are strictly logical, and do not depend upon any recorded observations. Rather, in his 1950 papers, he embarks upon a type of "thought experiment" to determine the conditions necessary in order for the estimation of future conditions to be possible. It is this entirely logical-theoretical character of his argument that gives his results a kind of broad-based applicability: while the findings of quantum mechanics are specific to events occurring at the subatomic level, Popper's

argument can be generalized to encompass any similar prediction task, including those in classical physics and social science. We turn now to a detailed analysis of his general argument.

Let us assume the existence of X, a calculator, attempting to predict events that will occur in system Y. (1) Now it is a well-known principle that X can gather information about system Y only by interfering with that system in some sense. (2) This interference must somehow be taken into account if X is to predict Y events accurately, and this can be done only in one of two ways: (1) either the interference of X on Y must be sufficiently weak to be disregarded, or (2) X must be able to calculate the effects of its own interference on Y.

Let us take the first of these possibilities. To start, we need to note that even if we assume that X interferes weakly with Y, we must nevertheless admit that Y must interfere strongly with X. This is so because of the fact that small differences in conditions in Y at an early state will necessarily be compounded and create large differences in Y at a later state. For example, if we take as our system Y a set of balanced scales, and place a small weight on the right-hand plate of the scales at time $T(1)$, then at

time T(2) our observations should show the scales tipped dramatically to the right. (3) If, on the other hand, at time T(1) we place a small weight on the left-hand plate, then at time T(2) we should observe a tip to the left. The two different T(1) states may be as arbitrarily small in magnitude as we choose, yet the differences in the corresponding T(2) states will necessarily be much greater. In order for X to behave as an accurate predictor of the future state of Y, it must therefore be able to take these dramatic differences into account. It behaves, as it were, as an amplifier of the T(1) state of system Y. Thus, minute differences in T(1) conditions of Y strongly affect the predictions of the T(2) state of Y, which are generated by X. This is the same thing as saying that Y strongly interferes with X.

We have then, under this condition, a type of "one-way" interference present. While X does not interfere strongly with Y, Y strongly interferes with X. Now let us assume Z, a calculator which can study the combined system (X+Y) under similar conditions; that is, Z in a sense "knows" the relationship between X and Y. This assumption is permitted according to the deterministic principle that a successful predictor can be established for any physical system: Z will be our

successful predictor for studying the system (X+Y). Now either X "reciprocates" (in Popper's terms) Z's "interest" -- it knows of the presence of Z and can study it -- or it does not. If Z's interest is not reciprocated by X, then Z can, in other words, escape detection by X. This would be the same as saying that there is only a "one-way" interference flowing from X to Z. Occurences in any system which contains Z could not be predicted by the calculator X. If there is only one such caloulator Z outside some system, which can escape detection by an element of that system, then Z is immediately seen to be part of a system which is non-predictable, and this violates the deterministic assumption that for any system a successful predictor can be constructed.

The alternative to this is to posit that for every system there exists a "Z" which is superior to that system and undetectable by it. There would then exist an infinite series of Z(1) ... Z(N) predictors. But this series would not converge to any Z(M) predictor which would have knowable characteristics. For if the series did converge, then all predictors coming after a certain predictor Z(M) would differ very little from Z(M), and would therefore not be sufficiently dissimilar to be undetectable by Z(M). (Popper, 1950:

133) Since the series does not converge, this means that there would exist unpredictable predictors, because the result of a non-convergent infinite series cannot, in principle, be known. (4) Thus, positing a predictor Z which can predict events in the system (X+Y) without strongly interfering with that system necessarily places us in the position of positing some predictor whose own future actions cannot successfully be predicted.

If we do permit X to study Z, then the assumed "one-way" interference breaks down, for Z will clearly strongly interfere with X, and X (in X+Y) strongly interferes with Z. Thus, the interference of Z on the system is no longer sufficiently weak to be disregarded. It is therefore not theoretically possible to have sufficiently weak interference, and we are left with the second of our original possibilities; namely, that X can adequately calculate the results of its interference on system Y.

This calculation could be accomplished in one of two ways: (1) perhaps X is able to assess the magnitude of the interference of some of its parts, say X', on Y, or (2) perhaps X can calculate the results of its interference on Y by using certain predictions about its own future behavior. Again, let us examine

the first of these possibilities first.

We see immediately that it leads, in a relatively straightforward manner, to an unacceptable circularity. For if X can calculate the interference of some of its parts, X' , on Y , it is in effect studying a new system, the system $(X'+Y)$, and the interaction of X and this new system is obviously subject to the same problems as the study of Y by X . We are then back where we started. It would seem, then, that the only way in which X could successfully predict events in system Y is if it could utilize predictions which it could make about its own future states. This is the topic dealt with at length in the second of the two 1950 papers (Popper, 1950a).

Tristram Shandy, Kurt Godel, and Oedipus

Popper uses three arguments in this paper to explain and show the impossibility of self-prediction by a calculating agent. He introduces the problem by developing the consequences of the so-called "Tristram Shandy paradox". The paradox proceeds as follows.

Tristram Shandy is a man given the task of writing his autobiography. He wishes to make it as complete as possible, and to this end, he attempts to write down

every event that has occurred in his life. The problem is that no matter when he begins, the task cannot be completed. For as soon as he has written about his most recent experience, the most recent experience becomes his own writing about this event. He must then write this down. It is easy to see that the situation regresses infinitely: he is put in the position of constantly writing about what he has just written. In any finite period of time, the task cannot be completed. (5)

This paradox can be transferred into the realm of predicting future events if we assume a calculator C given the task of describing its own future output, say at time $T(5)$. We assume that at time $T(1)$ it is given all the information necessary to perform the task. At time $T(2)$ it begins its calculations. At time $T(3)$, then, it begins its description of the events occurring at time $T(1)+T(2)$. At time $T(4)$ we find it describing what has occurred between time $T(2)$ and $T(3)$. This will continue until time $T(5)+\underline{e}$, at which point it will have described $T(5)$. It is clear that \underline{e} cannot be equal to zero; that is to say, the complete description of what occurs at $T(5)$ can only occur after the event $T(5)$ itself. Thus a prediction of an event occurring at $T(5)$, which is tantamount to a description

of that event, can occur only after the event itself.

Now there are two possible ways of overcoming this. We may decide, for instance, to permit C to produce statements which refer to themselves in some sense, in order to overcome the problem of describing its own statements with additional statements. Alternatively, we may try to design a calculator for which we do not necessarily demand a complete final state description in order to meet the requirement of a deterministic calculator successfully -- that is, complete information is not necessary for final predictions. The first of these alternatives is dealt with by Popper in his discussion of Godelian sentences, and the second is treated in a discussion of his "Oedipus effect", a thing we have met before.

The idea of allowing the calculator to utilize self-referential statements to reduce e to zero, or less than zero, is an interesting possibility at first glance. If our C could be designed, for example, with a punched-tape output, so that the holes punched into the tape could convey information about the predicted event, and at the same time serve as a description of C's output (i.e., about the holes themselves) at the time of this predicted event, we could conceivably reduce e to zero or less. That is to say, C might then

be able to make predictions about its own future state before that future state actually occurred. Perhaps an example by Popper will make this idea clear:

Such a machine may perhaps use numbers as names of expressions of a certain shape; and it may then conclude its self-prediction by the following statement (occupying, say, the last 4 yards of the tape): 'The last fifteen yards of the tape are taken up in this way: the first twelve yards by two equally long series of holes of shapes No. 17,623,412 and 34,216,311, and the remainder by a series of holes of shape No. 612,522,947.' And it may turn out that the last mentioned number is indeed the number of the shape of the statement just quoted, perhaps even in conjunction with other statements. (Popper, 1950a: 176)

The fact that this proposal cannot succeed, however, is seen fairly easily when we note that this is precisely the method Godel used to prove the undecidability of self-referential statements.

Popper makes use of Godel's 1931 findings in a surprisingly simply and effective way. We saw earlier that in this paper, Godel demonstrated that in any sufficiently powerful system, we are faced with two choices: either an inconsistent set of axioms, or the production of well-formed formulae -- system statements -- that are undecidable within that system. The first of these alternatives is too catastrophic to be

entertained seriously, for we saw that from a set of inconsistent axioms, any conclusion whatsoever can be derived, thus eliminating any possibility of distinguishing true and false statements. We are faced, then, with the second consequence; that is, for any system S , a sentence which is undecidable within that system may be constructed. We will call this type of sentence a "Godelian sentence" and designate it by the letter "g". As a corollary to this, Godel showed that if g can be constructed, and "h", a sentence expressing this fact, can also be constructed, then h is also undecidable in S .

Now Popper asks that we assume that our calculator C possesses certain current information, J . We may then pose a question, $q(1)$, to C , and let C respond with "yes", "no", or "I don't know yet", depending upon the derivability of the answer from J . Then let us ask, at time $T(1)$, question $q(1)$: "If you are asked $q(2)$ at time $T(2)$, will you or will you not answer by signalling 'yes' or 'no'?" If we let $q(2)$ be a Godelian self-referential question, then it is easy to see that even if $q(2)$ is never in fact asked at time $T(2)$, the purely "empirical" (not strictly logical) question $q(1)$ cannot be answered by C . For $q(1)$ is capable of expressing the fact that $q(2)$ is undecidable

in J, and this corresponds to Godel's sentence h -- and thus it is in principle undecidable. (6)

The objection may be raised that this bit of information -- that $q(1)$ cannot be answered -- can simply be included in C's original information J. That is, we could strengthen the system J to include this fact. But all this really does is create a new system of information, J+1, for the calculator, and Godel has shown that a g-sentence can be constructed for any system whatsoever. The problem, then, is not evaded, as the regressive characteristics of this technique clearly show.

If self-reference is not a way out, perhaps being satisfied with incompleteness is. The second of our alternative solutions to the Tristram Shandy paradox suggested that we simply not demand a complete state description for determinism: instead, let us permit C to make predictions based upon incomplete information. This would, following Godel, permit both consistency and decidability. For Godel, completeness of a system refers to the fact that the system is capable of generating all number-theoretical statements. Obviously, the inability of a calculator to produce such statements would seriously hamper its practical utility. But we may assume for the moment that we are

willing to accept this limitation. Indeed, Popper's own analysis of the incompleteness of a calculator's system of information need not even reach this problem -- the Oedipus effect will be seen to result even if only knowledge of its current state is denied to C. Moreover, it is logically necessary that C be denied such knowledge.

To see this, let us first recognize what our own discussion has looked like. We have been studying a calculator studying a system (itself or some other system). We have therefore been performing a function similar to that of our previous calculator Z -- a "meta-system" calculator studying events in a "system" calculator. As such a calculator, we have been able to identify problems in system C which C itself was unable to recognize. We see then that it is not impossible to assume a very clever calculator, call it C(1), which can foresee all these problematic effects, and which can perhaps supply C with a piece of information inducing C to predict a certain T(i) state and at the same time causing C to be in that state at time T(i).

However, C's self-information of its state at time T(i) would have to be in the form of a physical description of that very piece of information. For example, if we let J(1) be the state of information of

C at T(1), we are also forced to assume that it possesses information J(2): "I have information J(1) at T(1)". But then the information is really J(1)+J(2), and this piece of information, J(3), must also be known by C. And so on. In human terms, C must not only "know", it must also "know that it knows", and "know that it knows that it knows", ad infinitum.

This is an infinite series of information, and no finite piece of information can encompass it. Yet no infinite piece of information can be completed at any instant of time. It is therefore logically necessary for any calculator to be unsure of the content of its own current information. The Oedipus effect is an unavoidable possibility in such a situation, and all routes leading to the construction of a calculator capable of predicting its own future states have been closed. This in turn eliminates the final possibility of constructing calculators which are capable of predicting any physical event, and determinism cannot logically be maintained.

Why Indeterminism is Not Enough

The above argument for indeterminism is an excellent one, but not even Popper himself is satisfied with it. (Popper, 1964: vi.) The focus of this dissatisfaction is the impact that physical indeterminism -- chance events in the physical world -- has upon the idea of free human will. Popper has remarked (1950a: 195) that the idea of an indeterministic physical world seems to comport with our "common sense" understanding of how the world actually works. (7) But it is also clear to Popper that this same common sense view holds that human beings are free to act deliberately and rationally, and their actions are not self-understood as merely the results of chance interactions of physical events.

In his 1973 essay, Popper notes that there appear to be two understandings of "chance". The first is "chance" understood as "accident" -- two independent causal chains which accidentally seem to intermix at some place and time, bringing about some event. As a typical example, he cites the case in which one causal chain loosens a brick in a wall, while another independent causal chain makes a man take up a position

where he will be hit by the brick. (Popper, 1973: 24) There is nothing in this view of chance which prohibits the possibility of determinism, for under such conditions, anyone furnished with enough information about the two causal chains could successfully predict the occurrence of the event in question.

But we have seen that quantum mechanics has uncovered a second type of chance -- absolute, radical chance. In this understanding, certain elementary physical events are perceived as logically unanalyzeable in terms of causal chains, but instead are seen to act according to certain quantum "jumps", which can be understood only within the boundaries of probability. These events are absolutely unpredictable, and are therefore controlled by no laws of nature. This is the type of indeterminism which Popper accepts and embellishes -- the indeterminism of the "dice-playing God". Such an indeterminism, however, is insufficient as an explanation of social phenomena for at least two reasons: (1) it cannot function as an adequate explanation of the human experience of free will, and (2) in and of itself, it logically degenerates into a position of pure relativism and skepticism (and therefore explains nothing).

The first problem is recognized explicitly by Popper when he writes:

... I want to point out that the indeterminism of a dice-playing God, or of probabilistic laws, fails to make room for human freedom. For what we want to understand is not only how we may act unpredictably and in a chance-like fashion, but how we can act deliberately and rationally. (Popper, 1973: 24)

The acceptance of indeterminism in the material world does nothing to promote a notion of free will and deliberation in human actions if in fact all our actions are materialistically determined.

To see what is meant here, note that we can and do speak of determinism in two senses, one involving the interactions of events in nature, and another referring to the absence of a source of human motivation which is independent of those material events. Even if we say that certain physical events can only be understood as having had no causes, there is no reason to suppose that human actions themselves are nevertheless entirely determined by such events.

In both Popper's and the quantum theorist's arguments only one chance-like event is necessary for the establishment of an indeterministic cosmos. Neither Popper's logical indeterminism nor the

physicist's observational indeterminism rules out the possibility of at least some events having causes. Indeed, for both Popper and the physicist, the set of events understood as having knowable causes is infinite in range, and it is entirely possible that the set of all human actions forms a proper subset of this set. In such a case, human actions could all be explained as the results of physical processes occurring in the material world.

But of course, such a materialistic view of human behavior directly contradicts our prima facie experience of deliberate choice and free will. It must maintain that this experience is not genuine and that it is in fact an illusion. However, it cannot explain in any way the occurrence of the delusion itself, nor even the occurrence of materialism as a doctrine. It is of some importance to examine this argument in detail. In the process of doing so, we shall see that such a materialistic view logically implies a purely relativistic account of truth and meaning, and that such a doctrine is self-contradictory.

Materialism and Relativism

To start, we offer the following definitions of "materialism" and "relativism". Materialism is here understood as the doctrine that human actions, including human thoughts, are fully understandable as the results of physical events, whether these events be themselves the results of material processes (and hence physically determined), or simply chance "occurrences". By relativism, we mean to point to the doctrine that what is understood as true is true only by virtue of being so understood. There is no absolute standard of truth which exists independent of our decisions to accept such a standard. A softer version of relativism would maintain only that if such an independent truth exists, we nevertheless cannot know of it, and therefore it cannot serve as a standard for human investigation or morality. We may call the strong version of relativism "pure" or "strict" relativism, and the weaker version "moral relativism", since it asserts that only in human action are relativistic considerations a necessity (the full meaning of this term will become apparent in the course of our argument).

To see that materialism implies strict relativism, let us first examine an argument to the contrary. The materialistic determinist must insist that all human activity is the product of physical forces, including thoughts and ideas (which are themselves merely the results of biochemical, hence physical, processes). This means, of course, that human actions willed outside of such influences are impossible. Indeed, such a willing itself becomes an impossible action, unless it is understood merely as a complex of delusions on the part of the individual claiming the ability to will. For the idea of a willful action implies the idea of a choice among alternative futures, while for the materialist the determination of all human action means that alternative courses of action do not exist -- we may behave only as physics forces us to behave. With the field of alternatives reduced to zero, the concept of choice itself is nullified, and this renders morality meaningless. The concept of moral human behavior requires the prior concept of a standard by which to gauge the rightness or wrongness of behavior, but in the absence of alternatives, no such standards can be constructed. Meaningful choice implies choice, and if choice is not present, neither is meaning. Thus, the materialistic doctrine

necessarily entails moral relativism at least, and this much is often admitted by the materialist. (8)

But does it entail the strict variety of relativism? The materialist wishing to deny that it does might maintain that even if our human actions cannot be endowed with standards of morality, they may nevertheless be understood as being more or less "rational", in the sense that "rational" means "in accordance with the facts of reality". The materialist may deny that standards of truth for moral behavior exist, and yet still maintain that there are nevertheless "facts" (about the physical world, for instance, or especially about the "truth" of materialism itself) which are true regardless of our ability to grasp them nomologically or to apply them morally. The delusion of free will could then be accounted for by reference to these "facts" -- by saying, for instance, that an individual suffering such a delusion was determined to do so by his genetic structure, social "instincts", or surrounding bourgeois social context.

But this notion cannot withstand argument. The materialist cannot maintain that his acceptance of materialism as a "fact" is either rational or irrational. It is, instead, devoid of meaning

altogether. If there is no room for free will, human actions can have no meaning (there is one exception to this that we will see in a moment). The question "What shall we do?" or "What should we believe?" cannot even properly be asked, since the notion of "should" implies a choice in the matter. This choice is missing in the presence of moral relativism. To the extent that the materialist asserts the truth of materialism, he proves its logical falsity, and to the extent that he acts on the basis of his belief, he proves his own practical inconsistency.

Not just the "fact" of materialism falls prey to this problem, but all purported "facts" about anything. If we have no choice, we cannot decide, and if we cannot decide, we cannot decide what is true. Materialism implies moral relativism, and moral relativism implies strict relativism, the only logical consequence of which is skepticism (but then, of course, there is no reason to promote logic). And thus the aims of materialism must be contradictory, for belief in it entails its disbelief. (9)

A belief in indeterminism in physics, logical or otherwise, does not help matters -- indeed, it only serves to exacerbate the problem of meaninglessness. It is possible, for example, for a strict determinist

(though not, perhaps, a materialist) to find meaning in human action even in the absence of free will. This was the position of Augustine, remember. In fact, for Augustine, human actions were meaningful only because they were fully determined by God, the source of all meaning. Any human action outside of God's will could only be arbitrary, not meaningful, and would anyhow show the incompleteness of God's will -- which Augustine regarded as an impossibility. A similar argument could be made that actions which are fully in accord with natural laws (leaving God out of the picture) are meaningful just because they fit in with some higher-order plan of Nature -- moving the whole structure of Nature ineluctably towards some end.

This teleological view of physics suffers, however, from the problem that the "plan" is meaningless if the "end" is meaningless, and no assertions about the meaning of the end of Nature, or even about its characteristics, can be made when the process is yet incomplete, as it clearly is. It would seem, in fact, that the only way to characterize successfully the "why" of nature is to remain willing to speak of its author, God. The greatest of all positivists himself expressed just this notion. After noting that "the true Positivist spirit consists ...

in studying the How instead of the Why", Comte proclaims that science must give up all attempts to answer questions of first cause ("Why?") because

If we insist upon penetrating the unattainable mystery of the essential Cause that produces phenomena, there is no hypothesis more satisfactory than that they proceed from Wills dwelling in them or outside them (10)

Thus, if a determinist is willing to believe in God, it is possible that meaningful human activity (though not free will) may be secured.

The indeterminist, however, is denied even this cold comfort. God the Great Architect becomes God the Gambler, and the playing of dice replaces the construction of Paradise. Nor is this the end of the matter, for with this attitude, the meaninglessness of human activity (even all activity) takes on a monstrously self-destructive character. Indeterminism itself becomes meaningless, even if true, and therefore cannot properly be understood as true. The claims of the indeterminist turn against indeterminism itself, and indeterminism cannot be maintained unless it is false.

We have seen, however, that indeterminism is meaningful, and is actually true, according to Popper,

Godel, and the quantum physicist. Therefore we must restructure our interpretation of reality to make room for free will in a way that physical indeterminism does not. The way to do this is to maintain not only the classical indeterminist view that the future of physical reality is open to itself, but additionally that this future is open to human intervention not wholly determined by physics. This is what Popper attempts to accomplish by his "Three Worlds" understanding of reality.

Relativism in Popper

Before turning to an elaboration of this idea, let us first note that it was not the problem of free will that originally induced Popper to formulate the "Three Worlds". Rather, the idea is the result of the problem of relativism showing up in his own earlier work.

Recall from Chapter 2 that Popper's methodological rule of "intersubjective testability" in science was to be regarded as a convention to be agreed upon by practicing scientists. Furthermore, when faced with the problem of giving a justifying criterion for agreeing to such a convention, Popper was moved to

propose a higher-level convention: that of the "problem situation" set in a "scientific tradition".

In turn, this reliance upon the criterion of the problem situation was seen to form the basis of his early attack on historicism as being "unscientific" -- as disregarding the conventions (methodological rules) developed within the main stream of scientific tradition. The problem is just that what Popper sees as a relevant "problem situation" and "tradition" is not considered relevant by the historicist. While Popper, for example, sees the "problem" as a matter of describing events in historical reality, we have in Marx an historicist for whom the problem is to change reality. Under Popper's conventionalism, either attitude is to be permitted, simply depending on which gets the more votes.

If methodological rules are nothing but conventions, requiring agreement for whatever validity they may have, then they become invalid once such agreement is withdrawn. The historicist has a point in claiming that his disapproval of the convention renders it useless, in much the same way that the violation of the terms of a contract by one of the parties to that contract nullifies it. Popper therefore does not escape the problem of relativism by introducing either

"convention" or the more refined notion of "problem situation".

Once this relativism is recognized, we are once again without foundation for even our agreement on the critical nature of specific problems, let alone agreement on the results of scientific method, or the structure of a methodology itself. Popper cannot compel agreement to his system, and therefore cannot compel agreement to the objective validity of scientific laws. The acceptance or rejection of both the method and findings of science remains a purely subjective act on our part (as Popper admits), and we seem equally justified in taking either course.

It would seem apparent then, that Popper's appeal to conventionalism as a means for filling the "holes" in his scientific system is unsatisfactory, for it gives us no objective reason for choosing one set of conventions over another. Using his system, we can conceive of no standard by which to measure the adequacy of science, or, to put it another way, we have no "science" of scientific methodologies. Such a "science" would actually be a "meta-science", or, using Popper's own notion that the model for science is physics, a "metaphysics". Nor is this simply a neat rhetorical trick. Metaphysics can be considered the

investigation into the structure of reality, being, and consciousness. If we conceive of science as not simply a methodology, a game to be played according to some agreed-upon rules, but as a mode of conscious activity itself occurring as an element of reality, then the choice of terms is a fortuitous one.

We must have recourse to such a "metaphysics" because the matter of choosing scientific methodologies is a serious one. It would not bother us if different methodologies led to similar answers in science, but the fact of the matter is that the choice of a methodology in a very fundamental sense defines not only the set of problems with which we can deal, but also the set of observations relevant to these problems, and, more importantly, the set of potential answers to these problems. Although many examples can be constructed to illustrate this point, one in particular comes to mind. (11)

It is an example which is familiar to any student of elementary statistics. It is usually formulated as the ecological fallacy and involves drawing conclusions about individual members of a population from data describing the population as a whole. As an exercise in making this point, I often ask my students to comment on the following situation: given two voting

precincts, one predominantly black which consistently votes Democratic, and one predominantly white which votes Republican, can we conclude that blacks tend to vote Democratic and whites tend to vote Republican, even if we control for all other relevant variables?

Intuitively, students often feel that such a conclusion is warranted. It is then left as an exercise for them to construct situations in which the conclusion fails. It is easy, for instance, to imagine that the majority race in each district splits its vote evenly, with the difference being made up by the minority race, which would permit the opposite conclusion. The point is that, methodologically, we are not entitled to attribute the characteristics of a population to particular individuals who happen to be members of that population.

But why is this so? Only because we believe in individuals which are somehow metaphysically distinct from the groups to which they belong. The fallacy results from a violation of the assumption of "methodological individualism" in the social sciences, which asserts simply that the fundamental unit of study and observation in social science must be the individual. (12) But this assumption has a metaphysical backing. We agree to study individuals as

a basic unit because we understand individuals to have a metaphysical status different from that of groups. Individuals are regarded as meaningful things, even apart from groupings. (13) However, a person with a different metaphysical outlook can easily reject this correlative assumption. If one regards race, economic class, or sex as metaphysically meaningful, or as determinants of individual behavior, then methodological individualism is easily rejected, and ecological reasoning becomes a desideratum. (14)

This problem of methodological relativism seems to have become apparent to Popper only after he became familiar with Alfred Tarski's "correspondence theory of truth". Prior to this, Popper was not inclined to invest his scientific statements with any truth-content whatsoever, other than that which may be determined by a statement's methodological relationship to other statements. But we have seen that such a position leads him to relativist and subjectivist attitudes towards the truth of scientific laws, and the consequent denial that such laws have a truth-content independent of the beliefs of scientists. That is, there could be no such thing as objective truth or "objective knowledge".

Tarski's theory of truth, and more importantly,

Popper's acceptance of such a theory, changed all this. The theory itself can be summed up in a single sentence: "Truth is correspondence to the facts". That is to say, a statement is considered to be true just to the extent that the proposition conveyed by the statement expresses a fact about reality. At first glance, it might seem difficult to see how such a "theory" could be regarded as resuscitating Popper's method of science, for it just changes the question "Is this statement true?" to "Does this statement correspond to the facts?", and requires us to determine what the "facts" of empirical reality are -- surely what we have been attempting all along.

But the real point to emphasize here is not the apparent change in the direction of our investigations, but the change in the very nature of scientific statements which this theory proposes. Prior to its acceptance, Popper could quite legitimately treat only the relationships between statements, without ever being forced to declare that such statements in and of themselves were the bearers of truth. With Tarski's theory, however, statements are treated as having a nature which is independent of any human belief in that nature. Any truth which is contained in them would therefore be "objective" truth, and there could exist

such a thing as "objective knowledge."

Upon realizing these consequences of Tarski's theory, Popper began groping for a way of characterizing reality which would account for the possibility of objective truth, a characterization which would also have two pleasant side-effects: it would repair the holes in his view of science, and it would permit the assertion of free human will. This characterization comes to us in the form of Popper's doctrine of the "three worlds" of reality.

The Three Worlds

We may now turn to an analysis of Popper's idea that reality comprises three distinct and overlapping "worlds". A couple of preliminary points need to be made here. First of all, in his original exposition of the idea of "three worlds" with which human knowledge may be said to interact, Popper called these worlds the "first", "second", and "third" worlds. Following a suggestion by Sir John Eccles (1970), he now prefers the terms "World 1", "World 2", and "World 3", for reasons which are rather obvious. (Cf. Popper's "Preface" to Popper, 1979) Secondly, Popper's use of the three worlds idea should not yet be considered a

metaphysical doctrine. It is above all an heuristic device, and this must be kept in mind. It does us no good to rail at Popper for what might appear to be a rather arbitrary classification. He himself notes that his use of this classification scheme is merely a convenience, and largely for discussion purposes only. (Popper, 1979: 106-7) He does not intend by this classification a complete description of reality; rather, he looks upon it as a means for understanding several facets of human knowledge -- a phenomenon of reality -- and the relationship of such knowledge to other phenomena of reality.

Let us begin by examining the characteristics and content of World 1. This world is perhaps the simplest of the three to understand. It is simply the physical world, as it exists independent of human experience. (Popper, 1979: 74) Popper is not troubled by the arguments of those philosophers who would have material reality somehow dependent upon human observation. Instead, calling himself a "materialist" and a "realist", he claims an independent existence for material reality. He is not, however, a materialist in the sense that materialism is the view that "(extended) matter is something ultimate or irreducible, or that it alone is real." (Popper, 1979: 323, n.7) We are given

two reasons for the acceptance of this independent existence. One is basically Einstein's claim that there is no reason not to accept such a reality, and that there is no harm done in accepting it:

I do not see any "metaphysical danger" in our acceptance of things --- that is, of the objects of physics ... together with the spatio-temporal structures which pertain to them. (Einstein, quoted and translated in Popper, 1979: 42)

The second argument in favor of independent existence Popper ascribes to none other than Winston Churchill, whom he regards as a highly skilled epistemologist, going so far as to deplore the fact that Churchill is not included in the Encyclopedia of Philosophy. He is much impressed by the following argument of Churchill's:

I have always rested upon the following argument which I devised for myself many years ago ... [Here] is this great sun standing apparently on no better foundation than our physical senses. But happily there is a method, apart altogether from our physical senses, of testing the reality of the sun ... astronomers ... predict by [mathematics and] pure reason that a black spot will pass across the sun on a certain day. You ... look, and your sense of sight immediately tells you that their calculations are vindicated ... We have taken what is called in military map-making "a cross

bearing". We have got independent testimony to the reality of the sun. When my metaphysical friends tell me that the data on which the astronomers made their calculations were necessarily obtained originally through the evidence of their senses, I say "No". They might, in theory at any rate, be obtained by automatic calculating-machines set in motion by the light falling upon them without admixture of the human senses at any stage ... I ... reaffirm with emphasis ... that the sun is real, and also that it is hot --- in fact as hot as Hell, and that if the metaphysicians doubt it they should go there and see. (Churchill, 1947: 115ff., quoted in Popper, 1979: 43)

Popper regards Churchill's argument not only as a valid criticism of subjectivist philosophy, but also "as the philosophically soundest and most ingenious argument against subjectivist epistemology that I know." (Popper, 1979: 43) It is to be noted that Churchill's calculating-machine argument (a type of Turing machine programmed by Newtonian theory, apparently) provides for Popper an excellent refutation of some specious arguments, but it does not and cannot prove realism, as Popper notes. For as we have all experienced, an idealist can simply respond that we have dreamed up the entire enterprise: calculating-machine, sun, Newtonian theory, spots, and perhaps even ourselves. Popper regards this line of attack as rather silly, since it is universally applicable, thus unfalsifiable, and thus unscientific. Besides, he can always fall back on

Einstein's claim that there is no particular harm done in avoiding solipsism, and no particular advantage to be derived from supporting it.

If World 1 is that world which is independent of human perception and thought, World 2 is precisely the world of this perception and thought. This difference does not mean that the elements of World 2 (human thoughts and dispositions) are in any sense "spiritual" or are not themselves bound to material reality. Indeed, Popper attempts to show (Popper and Eccles, 1977) that almost all human thought processes can be explained as resulting from biological and therefore material conditions. But if they are not spiritual, they are not wholly material, either, in the sense that the laws governing the processes of human thought cannot be reduced to the laws of physics, in spite of the fact that thought processes occur in a material medium. (15)

The difference between World 1 and World 2 is not simply the old positivist difference between facts and values, or between objective reality and subjective feelings, however. Certainly there is some of this evident in Popper, since he consigns evaluative actions to World 2 and objective physical phenomena to World 1. But the phenomena of the two worlds interact in a third

world, World 3, the world of what he calls "objective knowledge":

What may be called the second world --- the world of the mind --- becomes, on the human level, more and more the link between the first world and the third world: all our actions in the first world are influenced by our second-world grasp of the third world. This is why it is impossible to understand the human mind and the human self without understanding the third world (the "objective mind" or "spirit"); and why it is impossible to interpret either the third world as a mere expression of the second, or the second as the mere reflection of the third. (Popper, 1979: 148-149)

And we might add here that this is also the reason why it is impossible for Popper to interpret the second world as merely an outgrowth or a continuation of the first world, for if this were possible, there would not be these two constituent elements of reality combining to produce World 3.

World 3, in Popper's rubric, is a bit more difficult to comprehend. Put very simply, it consists of human artifacts. As such, it is a "natural product of the human animal, comparable to a spider's web." (Popper, 1979: 112) In its physical manifestation, World 3 is of course composed entirely of objects taken from World 1, but these objects are processed by World 2 subjective knowledge to form an object which is more

than a World 1 object. Instead, it may be viewed almost as an "incarnation" of human subjective knowledge. If we think about it, we can see that all human artifacts incorporate both of these characteristics. They are constructed of material, but they are constructed in such a way as to be shaped towards some human end (a World 2 element), and the process of shaping it involves thought processes (also World 2). The objects of World 3 are potentially infinite in number, and consist of everything from food and drink to buildings and highways to books and scientific theories.

Of these, Popper regards as most important, especially for his investigation, scientific theories, which are recorded in some sense. Information must be given a physical dimension by being placed in libraries, on computers, video tapes, in journals, and so forth, if they are to be a part of World 3. Utilizing subjective World 2 thought processes and knowledge to interact with World 1 and produce World 3 objects amounts to objectifying that subjective knowledge. It is objective in this sense: once incorporated into a World 3 artifact, it becomes independent of particular human beings, or of human beings in general.

To see that this is the case, Popper takes us on a thought experiment, and asks us to consider the possibility of a nuclear catastrophe destroying virtually every civilizational artifact, leaving only university libraries standing. Whatever pitiful remnants of the human race would remain could conceivably regain much of their former knowledge, and with relative ease rebuild their civilization. Comparing this with the situation in which the catastrophe destroyed everything including the libraries, we see that in the latter case it would clearly be much more difficult, perhaps impossible, for the civilization to be rebuilt. (Popper, 1979: 107-108)

This experiment is not so far-fetched as it might at first appear. In their description of the deciphering of the Linear B script, Ventris and Chadwick (1959) make the point that it remains difficult to reconstruct Mycenaean civilization on the basis of the decoded remnants, since most important documents of the day were written on papyri, which were destroyed in the fires of war. Archeologists have available only relatively unimportant documents, such as inventories and receipts, which were written on more easily available clay tablets (which were only baked

hard by the fires). To modernize the example, electromagnetic pulse radiation from large explosions would destroy information stored on magnetic media while leaving paper copy intact. (16) All this shows to Popper that human artifacts and recorded human knowledge retain a type of objective content, and may be considered to be truly independent of any human knower. It is in this sense that he talks about "Epistemology Without a Knowing Subject". (Popper, 1979: 106-152)

The notion that ideas recorded as World 3 objects have a type of objective reality independent of the original thinker is, I think, an important one. In my experience, students and professionals who fail to recognize this often have a tendency to think that they have successfully argued against an idea once they have impugned the motives or the character of the thinker, or the method which generated the idea. Such ad hominem argumentation is effectively prohibited by Popper's three worlds outlook, since character and motives remain World 2 objects, which cannot be managed within a logical structure -- they cannot be the objects of an argument.

Just as World 2 objects are not reducible to World 1 objects, they are not reducible to World 3 objects.

Let us take for example the difference between a thought as a World 2 object and a theory, a World 3 object. We saw earlier that according to Popper a statement is not a theory unless it meets certain minimum conditions: it must contain only strictly universal terms and strictly universal quantifiers. There is a third condition, however, which Popper does not explicitly show, and that is that theories must be recorded somehow. A thought might contain both universal quantifiers and universal terms, but Popper is not willing to grant it the status of a theory, unless and until it is expressed in linguistic, or, more generally, artifactual form. This is what gives theories their World 3 nature. The fact that they have this nature means that they have an objective knowledge content, and since that content is objective, theories may stand in logical relations to one another. Mental processes, however, may not. Hence, the scientific theories of World 3 cannot be reduced to simple mental processes:

The idea that a theory in its objective or logical sense may be reduced to the mental states of those who hold the theory ... is a trivial mistake: it is the failure to distinguish between two senses of the word "thought". In its subjective sense, the word "thought" describes a mental experience or a

mental process. But two mental experiences or processes, though they may stand in causal relations to each other, cannot stand in logical relations to each other. (17)

Since mental processes do not stand in logical relationship to each other, a notion which is expanded in Popper and Eccles (1977), there is no way in which the content of such processes can be objectively analyzed while they remain bound to World 2. For to analyze something objectively means to treat it in a scientific manner, which in turn means dealing with logical relationships among the elements of the analysis. Popper is here maintaining a type of fact-value distinction. We could, of course, simply ascribe "facts" to World 1 (and perhaps World 3) and "values" to World 2 (as being mental processes) and deny the idea that values could be objectively analyzed. But this is not what Popper does. These values can become theories by being expressed in appropriate form and translated into World 3 objects. Once they are so expressed, they may be analyzed logically, and hence objectively:

The fact that certain theories are incompatible is a logical fact, and holds quite independently of whether or not anybody has noticed or understood this

incompatibility. These purely objective logical relationships are characteristic of the entities which I have called theories, or knowledge, in the objective sense. (Popper, 1979: 299)

To the extent that the translation of World 2 experiences into objects of World 3 is accomplished, subjective thought can be objectified, and the positivistic distinction between objective fact and subjective value is blurred and overcome somewhat. If there exists a way in which to objectify personal human values, then there also exists a way in which to analyze these values scientifically. (18)

Popper's three worlds are so arranged that the second world interacts with the others, but World 1 and World 3 cannot interact without World 2:

The three worlds are so related so that the first two can interact, and that the last two can interact. Thus the second world, the world of subjective or personal experiences, interacts with each of the other two worlds. The first and the third world cannot interact, save through the intervention of the second world, the world of subjective or personal experiences. (Popper, 1979: 155)

Some clarification may be needed. The objection which might immediately be raised here is that the first and the third world do interact and can affect one another.

For example, suppose a meteorite, a World 1 element, strikes a university library, destroying some of its holdings, or, alternatively, that a human artifact, such as automobile engines, pollute the atmosphere to the extent that the "greenhouse effect" melts the polar icecaps. Are these not examples of the forbidden interaction? Popper, I think, would deny this, and argue in this fashion. Remember that World 3 objects have both physical content and objective knowledge content. When the meteorite strikes the library, it disturbs its physical manifestation (World 1) only. Although books may be destroyed and hence theories lost to us forever, this does not amount to an interaction between the theory and the meteorite. The meteorite does not criticize the theory. And in the second case, in which the influence is reversed, we have basically a similar situation. It is the material extension of the artifact which influences the physical realm, and not the theory incorporated into that artifact. Theories do not act, nor can objects criticize. Only in combination with something capable of evaluative decision-making can the relationship between physical reality and objective knowledge be made concrete and have any real meaning.

The physical world can influence thought processes

and vice versa. Mental processes can influence the objects of World 3 and, importantly, the reverse is also true. Our personal World 2 experiences can be and are extensively influenced by the objects of World 3, and to the extent that this occurs, we may say that a type of scientific analysis may have an effect on human values and behavior. This is important because it is this fact that gives meaning to the practice of science. Critical problems for human beings arise because of the interactions between worlds 1 and 2, and between worlds 2 and 3. We can scientifically analyze the objectified knowledge of World 3 and use the results to change World 2 processes and thereby to change the relationships between all three worlds, and thus human problems can be aided in their solution through the use of critical science. We should also note that this ability to analyze and affect mental processes means that subjective values can be changed, for better or worse, by rational investigation. We will see later, in Voegelin's analysis of Weber, that this claim directly contradicts the positivist separation of science and ethics.

Not all the elements of reality neatly fit into one or another of Popper's three categories, and he himself notes that the Stoics realized that human

language is peculiar in belonging to all three worlds coincidentally. (Popper, 1979: 157) Since language is composed of physical actions, it of course belongs to World 1. In so far as it "expresses a subjective or psychological state" or involves understanding (which would be changing our mental state), it belongs to World 2. And to the extent that it conveys information or a message which may entail or refute other messages, it belongs to World 3. The most important linguistic entities of World 3 are theories, statements, and hypotheses. Although the Stoics were the first to recognize the distinction between language as an object and the objects about which language speaks (which may be other languages), the full importance of this distinction is still often lost. (19) We must not, however, ignore this distinction if we are to avoid the twin traps of a subjectivist epistemology on the one hand, and a morass of liar's paradoxes on the other.

Popper does not divide reality into three worlds just to have something to do. The autonomous nature of the third world is very important because he believes this idea to be in direct contradiction to some of the primary thinkers in the area of epistemology and scientific knowledge. He distinguishes, for example, between two groups of philosophers. The first consists

of those who, like Plato, accept an autonomous World 3, but who believe it to be superhuman in the sense of being divine and eternal. (20) The second group consists of those who "like Locke or Mill or Dilthy or Collingwood" believe that language and what it expresses is purely man-made, and who therefore see linguistic things as being parts of the first and second worlds only. They would then reject the possibility that there exists a third world of objective content for human language. (Popper, 1979: 158)

The problem with both of these approaches for Popper is that they hypostatize reality into two radically separate categories, with no real hope for epistemological interaction between them. The first approach leads to the problem of essentialism, and therefore to a scholasticist approach to language and knowledge, an approach which must by its very nature be unscientific, as we have seen in his critique of historicism. The second approach leads in two different directions: either we have a purely subjectivist epistemology, which in its logical extension leads to solipsism, or we have a type of "bucket theory of the mind". This "theory", which Popper finds in Locke, holds that objective knowledge

is presented to the mind through the senses, that somehow the mind is simply predisposed to collect data from the outside world in the manner of a tabula rasa. This approach, however, ignores the fact that human senses are themselves predisposed to filter reality and therefore in a sense bias the perceived "facts". Gestalt psychology and Kant's First Critique are good examples of arguments which establish the effect. Popper expresses this effect (see especially Popper and Eccles, 1977) as a type of hypothesis formulation taking place at the biological level. There exist no objective facts which present themselves in all their factuality to us. Everything which we perceive and accept as fact must be regarded as being of hypothetical nature.

So for Popper, reifying World 3 or denying its existence are equally unsatisfactory. The only alternative then is to have the third world be composed of thought processes and material, but to grant it a type of autonomy which permits it to retain objective content. By doing so, he finds himself able to reintroduce both free will and an element of "realism" into logic, science, and history.

Free Will and Realism

With the three worlds idea, Popper now has in place an heuristic which permits the incorporation of free will into our interpretation of reality. The original argument for an indeterministic physical reality (World 1) -- a reality whose future is "open" to itself -- permits free will but does not necessitate it. For if World 1 remains closed to influences from worlds 2 and 3,

... a closed indeterministic World 1 would go on as before, whatever our feelings and wishes are, with the sole difference from Laplace's world that we could not predict it, even if we knew all about its present state: it would be a world ruled only by chance. (Popper, 1973: 25)

If we are to affect events in World 1, however, that world's future must be left open to influences from worlds 2 and 3. Popper's understanding accomplishes this opening, and the experience of free will can then be accounted for.

The three worlds also provide a refuge for Popper from the relativistic consequences of his conventionalism. (21) The World 3 link between worlds 1 and 2 keeps these latter two worlds from being

identified with each other, preventing both solipsism and relativism. This means that there can exist facts about reality (although knowable only as hypotheses) which are as they are independent of what anybody thinks about them. These facts may then perform as standards by which to measure statements and theories, using Tarski's idea of truth as correspondance to the facts. All assertions (which are, again, really hypotheses for Popper) in World 3 may then exhibit more or less correspondance to facts, and may accordingly be considered more or less truthful. To the extent that our hypotheses are true, or, conversely, that we may assert hypotheses to be false, we may lay claim to knowledge. Since these assertions and hypotheses are "exosomatic artifacts" (Popper, 1979: 286) of World 3, they are understood as having an objectivity which in turn permits us to say that "truth" and "falsity" are not relativistic matters.

It is very important to note that Popper's argument for objectivity in knowledge and standards of truth is not harmed by the claim that we can never know anything with certainty. Indeed, quite the opposite is the case -- the claim for objectivity comes out of a prior realization of uncertainty.

To see this, let us permit the subjectivist to

make the claim that all our "knowledge" is of an uncertain, and therefore subjective, character. (This would amount to denying the reality of World 3). For purposes of brevity, let S stand for the assertion "All our knowledge is uncertain". We may now question the certainty of the knowledge expressed by S. If S is asserted with certainty ("I know that I don't know"), then S is clearly false, and certain knowledge is possible. If, however, S is asserted as an uncertain proposition, the possibility remains open that S is true, but we could never know the truth of S, and we are therefore not entitled to believe in subjectivism.

The argument from the uncertainty of S regresses indefinitely. We may let S' = "S expresses an uncertainty", and pose a question about the certainty of S'. We may then repeat the process as often as we like. If at any point certainty is claimed for one of these statements, logical self-contradiction is the result. If certainty is never claimed, uncertainty is compounded indefinitely. The problem is that we must claim the certainty expressed by this last sentence (i.e., "If certainty is never claimed, uncertainty is compounded indefinitely."), and there would then seem to be certain knowledge -- of our ignorance.

How can the subjectivist explain this peculiar

self-contradictory knowledge of his own ignorance? He cannot, for his notion of knowledge as an entirely World 2 phenomenon means that the introspection of the above argument must continue indefinitely. With his "Trinitarian" view of reality, however, Popper can explain the paradox. Since worlds 1 and 3 differ from World 2, truth has a component independent and not wholly capturable by either World 2 (our thoughts) or World 3 (our science). This explains our ignorance. Yet since the three worlds interact, or more specifically, since worlds 1 and 2 interact in World 3, we have partial, uncertain knowledge; we have knowledge of our ignorance. (22)

Popper's view explains uncertainty, but of course does nothing to alleviate it. Indeed, it cements it firmly into place as a cornerstone for his edifice of science. Recall that one of the conventions of his game of science was that the search for knowledge must never be regarded as completed. We now see why this is a rule deserving of agreement by scientists: discarding it would mean discarding the three worlds doctrine, as well as the fundamental uncertainty and incompleteness on which the doctrine is based. The problem of relativism is finally overcome by his authoritative appeal to the three-world structure of

reality as a reason to accept his methodological rules.

So why continue to talk about methodological rules as conventions, instead of simply saying that they must be accepted because they are the true rules for scientific investigation, corresponding as they do to reality's factual structure? If Popper would take this simple step, the conventionalism and consequent relativism that dogs his heels would disappear. In its place would be a fully-elucidated and well-argued case for the objective validity of his system of investigation. In turn, this would put the final nails into the coffin of historicism.

To take such a step, however, would be to abandon his own attempt to avoid metaphysics, and this he refuses to do. The three worlds conception of reality is regarded by him as an heuristic device only -- not a metaphysical statement about the "actual" structure of reality. Nor are any of his methodological rules to be regarded as metaphysical propositions. He is very clear on this point, as, for example, when he writes that

The belief in causality is metaphysical. It is nothing but a typical metaphysical hypostatization of a well-justified methodological rule -- the scientist's decision never to abandon his search for

laws. (Popper, 1968: 248)

Two key concepts stand out in this passage: "decision" and "well-justified". I mean to show that to the extent that Popper continues to rely solely upon the decisions of scientists to accept such methodological rules, such rules are in fact not "well-justified".

Conventionalism Redivivus

We have constructed a rather strong case outlining the problem of conventionalism in Popper's philosophy of science. It must not be assumed, however, that this problem is one of which Popper is unaware: it was, after all, a major reason for his development of his three worlds idea. In a reply to a charge by Freeman and Skolnowski (1974) that his conventionalism renders all science subjective, Popper writes:

... what I wish to make quite clear, is that I am not a conventionalist: I hold that although we build our own systems or frameworks, we do everything we can to let "nature" decide between them. (Popper, 1974:

1070)

Nevertheless, Popper misses the point here (as do Freeman and Skolínowski).

The problem of conventionalism is an epistemological one, not strictly a methodological one. This is to say that one does not choose to be a conventionalist or not on the basis of methodological strategy, despite Popper's insistence that the only way to judge a methodology is by its successes and failures. Instead, conventionalism is at least in part the result of an epistemological quandry generated by Popper's choice of methodological principles. The issue is not whether we shall let nature decide methodological controversies: the issue is how we shall ever know what her decision is. We cannot know this by appealing to the methodology itself, and therefore, if there is to be such knowledge, it must come from outside science as it is defined by Popper. If, as we have seen, Popper is unwilling to permit travelling beyond the boundaries of the line of demarcation into an objective metascience, then intersubjective agreement, conventionalism, is all that is open to him. He must remain a conventionalist, despite his protests to the contrary.

Popper's otherwise excellent criticisms of the historicist ultimately fail to satisfy in the absence of this final step into the land of metaphysics. We have seen that criticisms of historicism as unscientific could justifiably be shrugged off as irrelevant by the historicists, who simply respond that they are committed to alternative ways of knowing. Popper then found it necessary to attack historicism as quite simply false, involving logical self-contradictions. But logical consistency is seen to be a metascientific criterion for science, to be valued only as a methodological principle. To the historicist's objection that logic has no inviolable and fundamental value, but serves merely as a humanly constructed means to subjective ends, Popper can give no convincing reply. He can only contradict, and present a system which opposes historicism.

Furthermore, his idea that the fruits of the system of science -- its ability to solve problems -- somehow validates the use of his science, and thereby amounts to "letting nature decide" among methodological systems, falls victim to his own analysis of problem situations. This is so because no decision by nature can be understood outside of the context of the problems relevant to the practicing scientist. The

historicoist may in fact be interested in different problems -- "changing" the world rather than "interpreting" it, for example -- and therefore choose a set of methodological principles on grounds different from those of Popper's scientist. Should Popper make the claim, as he does in The Poverty of Historicism, that even given the historicoist's own problem situation, historicism is a poor method, this point, too, may be finessed by the addition of another less obvious problem with which the historicoist is concerned: the overcoming of the limitations of Popper's method itself.

We have seen that Godel has shown, and Popper has admitted, that there are areas of truth which extend beyond the boundaries of logical consistency and proof. A good friend of mine, who also happens to be a determined Marxist (pun intended), was once totally unimpressed by a series of logical contradictions which I had observed had been generated by some of his remarks. Logic, he told me, like language, was a human invention -- designed to be used as a tool to reach desired ends, to solve problems. If these ends can be better reached by being illogical, he asked, why not dispense with logic?

His point was immediately obvious, and I had no

reply. If logic is indeed merely a tool, then it would be just as "irrational" to use it to promote a logically inconsistent end as it would be to use the calculus to write music or to drive a nail with a light bulb. (23) The real point, of course, is that without an objective standard for the evaluation of ends, or at least a willingness to engage in the search for such standards, logic need not be treated as an end in itself (or even as an inviolable standard for the successful pursuit of such an end). And when logic is treated as a means only, it must compete with other means on the basis of how well it fulfills the obligations imposed upon it by some end. No attack, no matter how well mounted, against logical inconsistency can be successful against one who is uncommitted to logic.

Thus Popper's argument against the historicist's mode of inquiry must develop into an argument against the problems relevant to the historicist, an argument, in effect, against the aims and values of the historicist. This of course means that Popper must be willing to engage in the evaluation of values, and, moreover, must make certain critical standards and methodological principles available for such a task.

Facts, Values, and Problems

For the positivists, such standards and principles are in principle impossible, because of their unwillingness to assign meaning to statements having to do with norms and values. Statements about empirical reality (however defined) are the only meaningful statements, and are therefore the only ones capable of being handled through the use of a critical methodology. Popper, while not reaching quite as far as the positivists -- he does not regard value statements as meaningless -- nevertheless does maintain that value statements are methodologically unanalyzable, because they are unfalsifiable. Scientists therefore disdain to talk about values, since "so much talk about values is just hot air." (Popper, 1974: 154)

Values, however, are meaningful, because they "emerge together with problems", and thus consideration of values may be incorporated into the analysis of problem situations which impel the scientist on his quest, and which serve as standards for measuring the fruits of his efforts. Values could not exist without problems, says Popper, and are therefore meaningful to the direction of scientific inquiry. (Popper, 1974:

154)

But from where do we get our problems, and hence our values? Clearly, says Popper, we cannot get them from World 1 objects of physical reality, i.e., "facts", for

... neither values nor problems can be derived or otherwise obtained from facts, though they often pertain to facts or are connected with facts. (Popper, 1974: 154)

The key concept here is contained in the term "derived". All Popper is saying here is what every logician knows: the conclusion (derivation) of an argument can contain no more information than what is already present in the premises. (24) Since no values and no problems are present in World 1, we cannot derive value statements from statements about World 1, no matter the extent of our logical manipulations.

Nor does Popper believe that values and problems enter the world only with the development of consciousness:

... values enter the world with life, and if there is life without consciousness (as I think there may well be, even in animals, for there appears to be such a thing as dreamless sleep) then, I suggest, there would also be objective values ... even

without consciousness. (Popper, 1974: 155)

In one sense, then, values enter into the world (meaning the combination of the three "sub-worlds") simply because of the life problems inherent in existing as a biological agent. Simply being alive (as oppose to simply being) presents problems to the organism, chiefly in the form of needing to sustain "life". These problems force the organism to attempt to bring about end situations which would alleviate the problems -- in effect, to value these ends.

Since such problems are biologically encoded in the organism, (25) they do not occur as the result of conscious deliberation and are uninfluenced by subjective considerations. Therefore, such values as may obtain from the problems may be understood as being objective. In fact, for these problems we need not even presume the consciousness necessary for subjectivity, and hence we may speak of any organism "valuing" without at the same time imputing consciousness to it.

This is not the end of the matter, however, for human consciousness at least (a World 2 phenomenon) brings with it more problems, and hence more values. (26) Such problems arise through the connection between consciousness and World 1, and are built up from the

earlier "life problems" of the human being in his capacity as a living thing.

As biological entities, we have physical extension and thus our life problems demand that we interact in certain patterns with the objects of World 1. With the availability of consciousness, however, we may contemplate this interaction and these problems and thus introduce new problems and values "created by the human mind, on the basis of previous solutions", in attempting to solve the original problems. (Popper, 1974: 155) These new "problems of consciousness" and their attempted solutions then make up the "innermost nucleus" of World 3, "the world of problems, theories, and criticism." The values attending these problems and theories (and hence, scientific inquiry) remain World 2 objects of consciousness. However, one overriding value dominates World 3: "the value of objective truth and its growth." (Popper, 1974: 155)

This must necessarily be the case, since the generation and growth of objective truth is precisely the entire purpose of these nuclear World 3 objects in the first place. We value objective truth for its ability to aid us in the solution of problems of consciousness, which in their turn have arisen in our attempts to solve basic life problems. (27) And in

this sense, then, it becomes possible to speak of values as being not meaningless, nor even wholly subjective, but as indeed having some type of objectivity. Values do not exist "objectively" in the sense of being World 1 or World 3 objects, but the problems which generate these values, and without which they could not "exist" are objectively existing elements of reality. (28)

With the objectification of knowledge, Popper was able to attack the relativistic subjectivism of the historicist. Yet this would not be sufficient to preserve his own system from the relativistic consequences of his conventionalism. In order for him to do that, he would have to claim objective validity for certain values which would compel assent to his methodological principles. This he does by relating problem situations with values and showing the objective reality of those problems.

And yet, something remains amiss. The objective natures of truth, knowledge, and problems all depend upon the objective, real-world character of Popper's three worlds idea. Again, we must repeat the difficulty: if Popper is willing to assert that the three worlds idea is more than a heuristic device, that instead it actually describes certain structural

characteristics of reality, then and only then will the objective reality of this doctrine be passed down to the derivative ideas of problems, truth, and knowledge. and only then can he overcome the standpoint of the historicist.

Popper cannot, and will not, do this, for his line of demarcation dooms him from the start. He will not assert the three worlds doctrine as a metaphysical idea, for that would entail the admission that metaphysical statements can be seen to comport with reality to greater and lesser degrees. In that case, they would be testable, falsifiable, and his line between science and metaphysics would be erased. The doctrine must then remain a methodological principle, and as is the case with the rest of his principles, must rely on conventional agreement for its establishment. Popper ends up in imaginary conversation with the historicist:

P.: "You are wrong, according to my view of science, history, and reality."

H.: "And what proof do you offer that your views of science and history, and your understanding of reality, are correct?"

P.: "I have none, for I do not indulge in

metaphysics, but if you would just agree with me, you would see that I am correct."

H.: "I disagree with you. Therefore, you are wrong."

In the next, penultimate chapter, we will look briefly at two thinkers who do indulge in metaphysics, and perhaps take Popper's critique of historicism to its final, logical resting place. In the course of this indulgence, however, it will be necessary to break through the line of demarcation, with the consequence that the distinction between science and metaphysics will be preserved only in practice.

(1) X can be a human calculator (a scientific investigator) or some calculating machine, such as a Turing machine, specifically designed to predict events in the outside system Y.

(2) This principle was elucidated in its most complete form by Heisenberg. It is commonly known as his "Uncertainty Principle".

(3) We are of course assuming a perfect, frictionless balance here, influenced only by the weight placed on the plate.

(4) An interesting example of a non-convergent series which has plagued mathematicians is Grandi's series $1-1+1-1+1-1+ \dots$. Looked at one way, it is $(1-1)+(1-1)+(1-1)+ \dots = 0$, but under an alternative grouping, it becomes $1+(-1+1)+(-1+1)+(-1+1)+ \dots = 1$. The associative law of addition breaks down here, and the point is that since the series does not converge, the "correct" sum can never be known. Cf. Rucker (1982: 118ff) for an analysis of this series and its attendant problems.

(5) However, we can see that the paradox can be resolved if Shandy is permitted to live an infinite amount of time, for then no matter what event at time $T(x)$ must be described, there is always a time $T(x+)$ at which to describe it. But of course we are interested in autobiographies that can be completed within a finite period of time, just as we are interested in predictions, made by calculators, which are accomplished within a finite period of time -- notably, before the predicted event has actually taken place.

(6) The problem of the undecidability of certain system statements is seen more clearly in Rucker's (1982: 162) very brief and elegant summary of Godel's proof. It is reproduced here in full:

1. Someone introduces Godel to UTM, a machine that is supposed to be a Universal Truth Machine, capable of correctly answering any question at all.
2. Godel asks for the program and circuit diagrams of the UTM. The program may be

complicated, but it can only be finitely long. Call the program P(UTM) for Program of the Universal Truth Machine.

3. Smiling a little, Godel writes out the following sentence: "The machine constructed on the basis of the program P(UTM) will never say that this sentence is true." Call this sentence G for Godel. Note that G is equivalent to "UTM will never say G is true."
4. Now Godel laughs his high laugh and asks UTM whether G is true or not.
5. If UTM says G is true, then "UTM will never say G is true" is false. If "UTM will never say G is true" is false, then G is false (since G = "UTM will never say G is true.") So if UTM says that G is true, then G is in fact false, and UTM has made a false statement. So UTM will never say that G is true, since UTM only makes true statements.
6. We have established that UTM will never say G is true. So "UTM will never say G is true" is in fact a true sentence. So G is true (since G = "UTM will never say G is true.").
7. "I know a truth that UTM can never utter," Godel says. "I know that G is true. UTM is not truly universal."

(7) We will see later that Voegelin considers comportment with common sense to be a criterion for the selection of scientific methodologies.

(8) One could almost as easily substitute the terms "positivist" or even "behavioralist" for the term "materialist" in the above argument, and the results would be the same.

(9) The interesting corollary to all this seems to be that science and morality are inextricably linked. Without the possibility of moral choice, we can have no science, and without science (in the sense of testing

hypotheses) we have nothing to choose. This is in fact the position of the author. Jaki (1978) makes essentially this point when he theorizes that the rise of "modern science" could only have been accomplished in the "moral atmosphere" of Judeo-Christian traditions, contrary to popular belief that science occurred in spite of such traditions.

(10) (Comte: 1957: 51) Comte was unwilling to commit himself to this "satisfactory" belief and was therefore induced to give up -- even prohibit -- the asking of the question "Why?". Significantly, he notes that should the non-positivist persist in asking such dilatory questions, the "discipline of social feeling" will arise and check his tongue. (Comte, 1957: 39) The apparent self-contradiction of answering "why" we must give up asking "why" never seems to occur to Comte, at least in his supposedly "positivist" stage.

(11) Other interesting cases in which the assumptions of different methodologies contribute to different results might examine Marx and Weber's disagreement over the causes of capitalism ("material" versus "ideotypical"), Voegelin's (1957) "philosophical anthropology" versus Marvin Harris' (1979) materialistic interpretation, or perhaps Bernard Bailyn's (1967) ideological interpretation of the origins of the Constitution versus Charles Beard's (1935) "economic" one.

(12) Popper agrees with this assumption, and it forms part of his attack against historicism. (Cf. Popper, 1964: Chap. IV. 30)

(13) E.B. Portis (1983) points out that Weber goes so far as to assert that groups have no metaphysical status (no "meaning") at all, apart from the individuals who compose them. I am indebted to Dr. Vincent Ostrom for calling this to my attention.

(14) In my tenure as a statistical consultant, I once found myself advising several graduate students of history that they were committing the ecological fallacy by imputing motivations to individuals on the basis of class demographic data which they had assembled. The response by one is interesting: "It doesn't matter -- this is a Marxist analysis".

Even highly-regarded political scientists indulge.

Lipset's (1981) famous study on Fascism is replete with analyses such as this, in which he quotes the sociologists Loomis and Beegle:

"... areas in which the middle class prevailed ... gave increasingly larger votes to the Nazis as the economic and social crises settled on Germany." [This shows a] high correlation between Nazi vote and proprietorship (Lipset, 1981: 145, my emphasis)

The response to this by the methodological individualist is, simply put, that "areas" do not vote -- people do.

(15) In making and supporting this claim, Popper shows us a nascent cyberneticism which is more fully developed in Valetin Turchin's The Phenomenon of Science (1977). The fact that these thought processes are not reducible to such laws highlights what others have termed their "subjective" content, and so Popper prefers to consider World 2 the world of "subjective knowledge".

(16) Walter Miller's novel A Canticle for Liebowitz makes extensive use of the possibility of recovery of information from a World 3 object, in this case rebuilding civilization after a nuclear catastrophe from the plans for parts of an electric dynamo.

(17) (Popper, 1979: 298, my emphasis) Note that despite Popper's proclaimed lack of interest in the problem of defining terms, he here makes an important point precisely on definitional grounds. There are two senses of the word "thought", and we must be clear about which one we are using.

(18) Though the distinction is somewhat blurred, it is not entirely lost to Popper: he maintains it in the form of his "fact-decision" distinction, as we shall see.

(19) Among the more important contemporary thinkers who make use of and investigate this distinction are certainly Alfred Tarski and W.V.O. Quine. See especially Tarski (1965) and Quine (1960).

(20) I do not agree with Popper on this point, but criticism at this juncture would not affect his general argument. Suffice it to say that there is another way of looking on these three worlds in which Popper and Plato would agree. For Plato, the third world of human artifacts is certainly a product of interaction between World 1 and World 2, and in this case is not divine in origin. However, elements of divinity can be found in World 3 objects in so far as World 2 mental processes were influenced by the noetic connection of the human soul with the divine. It is entirely possible, however, to have human artifacts (such as the degenerate polis) which are predominantly influenced not by nous, but instead by the soul's apeirontic connection to Chaos.

(21) This refuge is only temporary, however, as the next section will show.

(22) The three worlds hueristic would also explain the paradox of Godel being able to prove mathematically and logically the incompleteness of mathematics and logic. This argument from the uncertainty of knowledge to the acceptance of a tripartite reality is mine, not Popper's, but I believe that it comports completely with his view. Indeed, it is a logical consequence of his way of looking at things, which only serves to justify his continuing interest in the "unintended consequences" of our actions.

(23) The problem of the relationship between logic and rationality is a very serious one indeed, and is one that has been heightened by Godel's work. If we take great liberties with the historical discussion of this problem, we can arrange solutions in several general categories:

- (1) "Rational" means "logically consistent". There are no truths which are not discernable through the use of logic, and no illogical statement can be true. This I take to be the attitude of the Cartesians, the early positivists, the Deists, and even perhaps the Benthamites.
- (2) "Rational" means at least "logically consistent", but in addition encompasses more than logic, in that the rational idea or

action must have reference to some absolutely true or good standard or end which is not itself provable by logic. No such standard or end could be demonstrably illogical, however. Plato, Aristotle, Greek Eudaimonism in general, and the early Christian synthesizers such as Aquinas and Dante might serve as examples here.

- (3) "Rational" means "logically consistent" only sometimes, but sometimes the truly rational attitude or action will seem to be logically inconsistent. The most memorable example of this is Kierkegaard's declaration that it is rational to be a Christian precisely because Christian doctrines are the height of logical absurdity. Godel's use of logic to prove that there exist truths inaccessible by logic also falls under this category.
- (4) "Rational" has nothing necessarily to do with logical consistency at all, the attitude of my Marxist friend. In this case, the adjustment of means to ends (as well as the selection of ends) is to be accomplished according to some rule or standard, such as the dialectical process of history, which may accord with logic, but which need not.

The problem with all this is that there is no way for a subscriber to one of the points of view to persuade someone who holds a different one, for it is the methodology of persuasion and debate that is really at issue here. Debate and persuasion must proceed according to agreed-upon principles of rationality, shared by the parties to the debate. If no such agreement is forthcoming, there can be no debate, and no persuasion.

This is why thinkers who come to one of these points of view from another often relate this experience as a type of "conversion", precisely paralleling the religious type (Whitaker Chambers and Arthur Koestler are excellent examples of this). They do not reach this point by being convinced: rather, they seem to experience some form of "revelation" or "enlightenment", which

does not seem to be analyzable from within that particular system of rationality. It is therefore often only presented as an autobiographical fact of dramatic importance -- every bit as dramatic as being struck down on the road to Damascus.

(24) Of course, in one sense conclusions do contain more information than the premises used to generate them, for the conclusion of a well-constructed argument may surprise us.

Given the syllogism:

All men are mortal.
Socrates is a man.

Socrates is mortal.

it is clear that a person knowing the information contained in the premises might nevertheless not know the conclusion in the way it is formulated. In that case an additional piece of information may be said to be needed: namely, that an argument constructed in this way generates a valid conclusion.

Yet we can also see that the conclusion itself does not and cannot contain any information not to be found in the premises. The situation is analogous to the fact that although encrypted texts and tape recordings require the use of aids in interpreting them, the aids themselves add nothing to the information available. Indeed, that is the whole point of rules of logic, ciphers, and tape players, and additional information would be regarded as "noise".

(25) Sometimes the response to the problem is also so encoded. Cf. Popper and Eccles, 1977.

(26) This is all reminiscent of Plato, for whom the body desires the things of the material world, while the soul desires God.

(27) In this same vein, Popper toys with the idea that the ability to criticize may have been generated through evolutionary processes and forms

our advantage over other members of our evolutionary chain. We can, in short, permit our hypotheses to die in our stead. Cf. Popper, 1979: 146ff.

(28) The usual subjectivist argument against such an assertion demands that we contemplate whether such values would exist in reality in the absence of human beings. The answer here is that they would not -- but this does not render those values subjective. It merely renders them humanly-created. This parallels precisely the "objectivity" of humanly-created world 3 knowledge.

VI. CROSSING THE LINE TO METAPHYSICS

To believe is to effect an intellectual synthesis.

-- Pierre Teilhard de Chardin

Where is the knowledge we have lost in information?

-- Eliot, "Choruses From the Rock"

We have seen that Popper's critique of historicism cannot succeed solely at the level of a critique of methodology, owing to the conventionalism necessary for him to establish his own set of methodological principles. Escape from this problem requires a criticism of the ends valued by the historicist, ends which prevent him from assenting to Popper's version of scientific inquiry. The development and presentation of a successful criticism of values and ends in turn depends upon a willingness to accept a reality in which statements about values can have some objective truth content, so that they may be arguable.

For a positivist to permit this would require the admission that metaphysical statements are meaningful, for the positivistic distinction between facts and values precisely parallels the distinction between meaningful and meaningless statements. But Popper has maintained, again and again, that his own line of demarcation is not a criterion of meaning. (Cf.

Popper, 1968: sec. 4) Statements about values are, to be sure, metaphysical in nature, but that does not render them meaningless. The line of demarcation does, however, render them unanalyzable, because Popper feels that statements of value are not subject to conclusive falsification.

Popper chides the positivist for making meaning the criterion of distinction between science and metaphysics, and rightly so. In his view, any statement is meaningful as long as it is significant for some relevant problem, and it is clear that at least some metaphysical statements are significant in this sense. It is useless, for example, to deride arguments for or against the existence of God as meaningless, for the very fact that such arguments exist bear testimony to their significance in the lives of certain thinkers, and therefore to their meaningful nature. But if meaning is not the relevant criterion, neither has Popper demonstrated an open and shut case for falsifiability as the relevant criterion.

We remember the problems with Popper's criterion of falsifiability as it was originally formulated in Chapter 2. If we are given a prediction derived from a strictly universal statement -- a theory or an hypothesis of science -- we encounter serious

difficulty in deciding when that singular prediction statement has been contradicted by observation. This is basically the problem of measurement error and perceptual reliability. But the important point to note is that even if we have established the contradiction of a prediction, we are not logically entitled to conclude thereby the contradiction of the original hypothesis. This is so because of the interference of certain initial conditions necessary for the derivation of the prediction. The contradiction logically proves only that the hypothesis or some initial condition has been falsified, and does not tell us which.

Moreover, we have seen that the attempt to determine whether an initial condition has itself been falsified relies upon logical derivations similar to the one posing the original problem. Popper's doctrine of falsifiability escapes the problem of induction by no longer requiring an infinite number of singular statements to verify a scientific hypothesis, but it falls prey to a similar problem: an indefinite number of singular statements is now required to demonstrate conclusively the falsity of a universal statement, and therefore no such conclusive demonstration can be made.

Popper's attempt to escape this dilemma through

the introduction of conventionalism fails, as has been demonstrated, and therefore we are free to entertain the possibility that scientific statements, just like metaphysical statements, are incapable of being conclusively falsified. Along with this possibility comes the possibility that metaphysics and science are finally indistinguishable, and coherent with this idea is the idea that the line originally drawn by the positivists between facts and values might simply disappear. This is indeed the claim made by Michael Polanyi and Eric Voegelin, so let us examine this a little more closely.

Michael Polanyi and The Smashing of Spectacles

Popper recognizes that all practicing scientists must operate within a framework. This framework, however, must never be regarded as a set of methodological rules dogmatically laid down. The scientist must be willing to jump out of one framework into another, if he is to maintain his pursuit of truth to the bitter end. But the case for such jumping about is not made in the form of an argument; it is rather a plea to the scientist that he behave according to

Popper's rules of proper inquiry. Should the scientist reject these rules, Popper cannot counter him except by simply calling him an ideologue and a bad scientist.

In a paper entitled "The Message of the Hungarian Revolution", (1) Michael Polanyi speaks metaphorically of the problem of jumping from one framework to another as the problem of removing one pair of spectacles and replacing them with another. (2) Viewing the world through the spectacles of a comprehensive framework amounts to the construction of a closed system, which Polanyi describes in Personal Knowledge as being composed of "implicit beliefs" with a type of circularity about them permitting them the capability of accomodating any conceivable piece of new evidence. (Polanyi, 1962: 268-292) This idea parallels Popper's own criticisms of closed societies, and especially closed scientific societies, with their reliance upon ad hoc hypotheses in order to perpetuate their particular methodological framework.

But while Popper only hints at the underlying psychological commitment to a particular framework, (3) Polanyi deals with it explicitly. A system that can interpret any possible fact in its own terms can be shaken only "by a preference for a total change of outlook". This is so because

... the whole person is involved in trusting a particular comprehensive outlook. Any criticism of it is angrily rejected. To question it is felt to be an attack on an existential assurance protected by the dread of mental disintegration. (Polanyi, 1969: 31)

Comprehensive methodological frameworks do not serve merely as convenient scientific rules of thumb. They have in addition a strong emotional value, and this value is in fact quite necessary for the adherent of the framework to have the strength of motivation necessary to carry him through the many pitfalls and disappointments which his necessarily incomplete system will produce. (4) To give just two examples, it is clear that Einstein's commitment to a scientific framework which would include a God who does not play dice is what accounts for his tremendous resistance to quantum theory and his willingness to engage in a fruitless search, lasting many years, for a unified field theory. Such commitment also goes far in explaining why, in spite of the fact that nominally communist countries have never fulfilled the predictions of Marx's analysis, Marxists rarely regard Marx as having been conclusively refuted.

How are such commitments to be analyzed, and as

importantly, how are the jumps from one commitment to another to be understood, for such jumps surely do occur? Can this be accomplished in scientific terms?

Popper's methodology clearly cannot aid us in answering these questions. His commitment is to a methodology which keeps open the possibility of jumping from one framework to another, but he cannot utilize that methodology to force a choice among frameworks. To do so would require that he be able to declare that one framework is objectively better than another. But frameworks are chosen according to relevant problems, and problems are chosen according to ends which are valued by the scientist or historian. Since these values remain unanalyzable by his methodology (he analyzes them only through the framework of his three worlds "heuristic"), Popper must remain silent on these questions.

We see then that although Popper does not wish to identify himself with the positivists in declaring value statements to be meaningless, he nevertheless accomplishes the same thing. His is a sort of "soft" positivism: values are certainly meaningful, but no scientific (i.e., "falsifiable") statement can be made regarding them.

Polanyi calls this attitude, shared by many

contemporary behavioral scientists, "moral neutralism". It is merely the separating out of the examination of values from the scientific enterprise:

Values admittedly enter into the lives of social scientists, but in the pursuit of science the scientist makes only statements of fact that can be observed by our senses. To state, for example, that the Supreme Court of the United States has nine members is to state a fact, while to say that its decisions are impartial is not to state a fact; this kind of statement is to be excluded from the science of political behaviour. (Polanyi, 1969: 29)

Polanyi produces two arguments against this notion of moral neutralism in science. In the first place, he notes, all men make moral judgements, a "fact" admitted by the moral neutralists, and when such judgements are made "we invariably refer to moral standards which we hold to be valid." That is, when we make these judgements, we intend universality (in Kant's sense) to the standards on which the judgements are based. (5) Making such a claim, however, entails distinguishing between moral truth and moral illusion, and this distinction in turn requires distinguishing between two types of motivation:

The awareness of moral truth is founded on

the recognition of a valid claim, which can be reasonably argued for and supported by evidence; moral illusion, in contrast, is compulsive, like a sensory illusion.

We then are forced to admit that true human values exist, and therefore "we have implicitly denied the claim that all human actions can be explained without any reference to the exercise of moral judgement".

The moral neutralist has a problem: his neutralism asserts that human values exist and that behavior predicated upon these values can be observed. The behavior can then be said to be caused by the actor's belief in a certain value. But this leaves open the question of why the actor believes as he does. Now it is clear that many possible styles of answers can compete at this point -- the Marxist, the Freudian, the positivist, the racist -- but if it is possible that true human values exist, it may be that reference to economic necessity, psychic dysfunction, or biological characteristics may have to compete with the possibility that the actor is behaving out of a genuine regard for a true value.

In Polanyi's example of Hungarian intellectuals rebelling against fake trials, it becomes possible that these intellectuals rebelled just because they knew such trials to be a real and actual evil. The

important point, though, is that the motivations of the actor cannot be decided without first establishing whether the end sought (such as fair trials) is in fact good or evil. If we cannot decide, or even discuss, this question, then we cannot decide that actors are not motivated by their regard for true values. Polanyi therefore concludes from this that "value judgement proves indispensable to the political scientist's explanation of ... behaviour."

The only way out of this problem is to deny the possibility of meaningful moral judgements in general: the position of a "hard" positivist, though not of Popper. This, however, leads to another difficulty, for if the social scientist is able to explain all human actions by value-free observations, then of course none of his own actions can be motivated by moral values. In other words, the scientist would have to explain his interest in his problem, choice of methodological framework, and his contentious argumentation on behalf of his interests and conclusions, in one of two ways. It must either be the result of a fully determined set of historical circumstances, or the result of meaningless random choices on his part. While this position would be consistent, it would be unbearably so, for in such a

oase everything the scientist did would be totally without meaning. Moreover, such a position would continually contradict the basic human experience of meaningful action and choice, as shown in Chapter 5. Neither could it explain the problem of the emotional commitment to a particular pair of spectacles, because it would be forced to deny the possibility of meaningful spectacles in the first place. The scientist could not even work with Popper's idea of the logic of problem situations, for what could qualify as a problem in the absence of the possibility of meaning?

Polanyi concludes from all this that the idea of moral neutralism, of a behavioral science which wishes to draw too fine a distinction between facts and values, must be rejected in favor of exactly the type of traditional political science which Dahl described for us in our introduction.

Objectivity and Personal Knowledge

Polanyi's distaste for the "fact-value" distinction occurs in part as a result of his critical objections to the parallel distinction between "objective" and "subjective" knowledge, as it is often drawn by moral neutralists and others. Modern man, he

says,

... has set up as the ideal of knowledge the conception of natural science as a set of statements which is "objective" in the sense that its substance is entirely determined by observation, even while its presentation may be shaped by convention. (Polanyi, 1962: 16)

Facts, in and of themselves, are objective, in the sense that they are as they are independent of whether they are observed by humans or acknowledged by them as facts. The possibility that they may not be observed or acknowledged is expressed by the "moderns" by positing a subjective component to human observation and knowing. This subjectivity, in the form of values, frameworks, and idiosyncratic personal characteristics, necessarily colors both our observations and our knowledge, thus robbing our perceptions of their objectivity. It does not, of course, do anything to alter the facts themselves.

Up to this point, I do not think that either Polanyi or Popper would disagree. The difficulty comes into play when the objectivists begin to insist that the purpose of science is to utilize a strict set of methodological principles to strip away the accretions of subjectivity, and thereby to observe facts and know

truth in all its objective purity.

Polanyi's point is, quite simply, that such a program is impossible, as it is at odds with the way human beings actually know. We and reality are so constructed as to make this subjective component not only impossible to overcome, but a necessary part of knowing and an essential part of existing. Instead of claiming that the proper way to acquire knowledge, or rather to investigate, is to shun subjectivity in favor of the dispassionate application of methodological rules, Polanyi asks that we accept at the outset that all human awareness and knowing is an intensely passionate experience, requiring personal commitment in the manner of faith. "Personal knowledge" is the concept Polanyi uses to aid this understanding, and while he admits that "the two words may seem to contradict each other", according to the modern view of things, "the seeming contradiction is resolved by modifying the conception of knowing." (Polanyi, 1962: vii)

The key to understanding Polanyi's "modification" lies in his treatment of the twin problems of "awareness" and what he calls the "tacit dimension" of knowing. His theory of how we know is based upon a fundamental principle of Gestalt psychology: "We

cannot comprehend a whole without seeing its parts, but we can see the parts without comprehending the whole." (Polanyi, 1959: 29) It is possible, say the psychologists, to advance from a knowledge of parts to a more general understanding of the whole which comprises those parts. Sometimes this is exceedingly difficult, says Polanyi, and in such a case we may be said to have achieved a discovery, but whether easy or difficult, in all cases the same comprehending faculty is at work. Furthermore, it is possible, though not very likely, that once we comprehend the whole, we may lose sight of it by intensely restricting our attention to the parts.

Polanyi maintains that once we comprehend a set of things as a coherent whole "the focus of our attention is shifted from the hitherto uncomprehended particulars to the understanding of their joint meaning." (Polanyi, 1959: 29, my emphasis) We do not, of course, lose sight of the particular in comprehending the general, since we can naturally see the whole only by seeing the parts. But once we comprehend the whole, "it changes altogether the manner in which we are aware of the particulars. We become aware of them now in terms of the whole on which we have fixed our attention." (Polanyi, 1959: 30) That is to say, our

knowledge of the particulars, and the particulars themselves, come to have meaning only within the context of the larger, more comprehensive generality.

He accordingly chooses to speak of two types of awareness or knowledge. When our attention is fixed upon particulars in themselves (at which point we of course do not recognize them as "particulars"), this is "focal awareness". This is distinguished from the "subsidiary awareness" of these particulars, in which they come to have meaning only in the context of a larger whole. In their subsidiary function, the particulars of which we are aware aid us in the comprehension of the whole. Therefore, they in effect perform the same function as clues or tools, and are actually used just as if they were extensions of our bodily selves.

Polanyi notes that the Gestalt psychologists are unlikely to see in the shift from focal awareness to subsidiary awareness anything but a passive experience, but in reality, he says, "it represents a method -- and indeed the most general method -- for acquiring knowledge." (Polanyi, 1959: 28) The reason for the hesitation on the psychologists' part is that they do not realize that this shift in attention involves a distinctly personal and active commitment on the part

of the individual. This contrary claim is one which Polanyi wishes to advance.

Tacit and Explicit Knowledge

In a lecture entitled "Understanding Ourselves", (6) Polanyi reminds us of our earlier difficulty with the problem of "knowing that we know", a problem similar to Tristram Shandy's infinite autobiography. As Polanyi treats it, the problem is one of elucidating the nature of human knowledge. The task, it seems, would be endless, for as soon as we completed it, the subject matter of the study "would have been extended by this very achievement." (Polanyi, 1959: 11) The logical difficulty generated by this problem is quite significant, but is one for which he offers a tentative solution. He suggests that we regard knowledge as of two kinds: explicit knowledge (that which is "set out in written words or maps, or mathematical formulae"), and tacit knowledge.

Explicit knowledge is the objective knowledge which we seek, but Polanyi asserts that it cannot be divorced from tacit knowledge. This latter is a type

of "unformulated" knowledge, such as we have of our own immediate personal experiences. The important connection between the two occurs when we realize that not only do we have knowledge of what we assert to be true (explicit), but we also at the same time have knowledge that what is being asserted is being asserted by us (tacit): "We always know tacitly that we are holding our explicit knowledge to be true." (Polanyi, 1959: 12)

If we are satisfied to regard at least part of our knowledge as tacit, then the problem of the infinite regress of our knowing becomes not a logical paradox to be overcome, but instead an accurate description of a fundamental experience of existence. Now the objectivist or positivist standpoint would simply deny the character of knowledge to this tacit dimension, but because to do so would leave open this paradox, and furthermore deny what Polanyi believes to be a basic (hence irrefutable) human experience, Polanyi chooses instead to accept this tacit character of knowledge and to examine the structure of consciousness in its light. (7)

Accepting the fact that all knowledge contains a tacit component -- specifically, the assertion that the knowledge is true -- means that at every stage in the

process of knowing, a personal commitment on the part of the knower is made. This applies especially to the move from a focal awareness of particulars to a subsidiary awareness of them. Thus, comprehensive knowledge is not obtained as the result of the dispassionate application of rules. It is rather a highly individualized and personal process. Indeed, it is best understood as the practice of an art or craft, a skillful endeavor:

I regard knowing as an active comprehension of the things known, an action that requires skill. Skillful [sic] knowing and doing is performed by subordinating a set of particulars, as clues or tools, to the shaping of a skillful achievement, whether practical or theoretical. (Polanyi, 1962: vii, my emphasis)

Methodological principles of science may be understood as "particulars" of which we need to be subsidiarily aware: the "clues or tools" which we mentioned earlier. We have usually achieved focal awareness of them through our knowledge of their "success" in related endeavors. Thus, mathematical principles have been observed to carry with them a certain reliability and consistency, characteristics which we might value in our pursuit. A strict concentration upon mathematizing events occurring in

society or history, in order to "understand" them, however, would be to subordinate the thing being studied to the technique being used to study it. It would be to commit ourselves to a focal awareness of the particular. In order for mathematical principles to be useful to us, (indeed, in order for them to be meaningful at all), we must become subsidiarily aware of them in the greater context of the whole to be studied. (8)

Similarly, it will be seen to be impossible to come to an adequate understanding of a political system by focal concentration on one or several particular aspects of it, say voting behavior or the legislative process. Knowledge of these particulars is necessary, but it is not sufficient: it must be accompanied by a personal commitment to larger, integrating wholes, and by the awareness of our assertions of truthfulness. Moreover, the need for such commitment extends to each individual practicing scientist: it cannot be avoided by a "division of labor" which would esteem concentration on minute details to the exclusion of the whole. For as both Popper and Voegelin agree, ignoring a larger context makes the selection of details to study an impossible task.

Remaining confined by focal concentration on

methodology and knowledge of particulars must be forsaken in favor of the willingness to choose from among tools those that are relevant in the larger context of some whole. Since such choosing is the essence of personal commitment, Polanyi calls knowledge "personal", and since it cannot itself be bounded by a methodology, there are no rules to this game. Science, like all knowing, becomes a craft, and its practice requires personal skills and virtues on the part of the scientist.

Indeed, the successful practice of science is a profoundly skillful performance, and it is a well-known fact, says Polanyi, that "the aim of a skilful performance is achieved by the observance of a set of rules which are not known as such by the person following them." (Polanyi, 1962: 49) Polanyi adduces several examples to support this claim, showing that knowledge of the rules of say, swimming or bicycle riding, is not enough for the successful performance of these skills. (9) In fact, should the performer attempt to concentrate primarily on these rules, he would find himself unable to perform, just as a scientist who concentrated exclusively on methodology would be unable to pursue his investigation successfully. The rules are useful, but they do not

determine the practice. They are not definitions, they are maxims, and "can serve as a guide only if they can be integrated into the practical knowledge of the art. They cannot replace this knowledge. (Polanyi, 1962: 50, my emphasis)

The personal participation of the knower in the known does not mean that knowledge must be subjective, in the sense of being idiosyncratic, however:

Comprehension is neither an arbitrary act nor a passive experience, but a responsible act claiming universal validity. (Polanyi, 1962: vii.)

Here we are sort of back where we started, addressing the problem of how such intensely personal knowing can validly claim such "universal validity". And it is at this point that we saw Popper trip over his line of demarcation, in his quest to regain objective status for scientific truth. Polanyi does not stumble, deftly erasing the line and declaring a metaphysical backing for the objectivity of human knowledge.

There exists, he tells us, a reality beyond that which is sensorily perceivable, which is nevertheless real and apprehendable. This idea, he acknowledges, is one not widely accepted these days:

To say that the discovery of objective truth in science consists in the apprehension of a rationality which commands our respect and arouses our contemplative admiration, that such discovery, while using the experience of our senses as clues, transcends this experience by embracing the vision of a reality beyond the impression of our senses, a vision which speaks for itself in guiding us to an even deeper understanding of reality -- such an account of scientific procedure would be generally shrugged aside as out-dated Platonism: a piece of mystery-mongering unworthy of an enlightened age. Yet it is precisely on this conception of objectivity that I wish to insist (Polanyi, 1962: 5-6)

This is not simply a heuristic device, like Popper's three worlds. It is, in Polanyi's view, a fact about the structure of reality as it is experienced by human beings, and since no amount of human intervention or disregard can change this fact, it is objective and true.

That such a reality is rationally apprehendable is seen by the fact that human intellect is used to perceive and acknowledge its reality. Polanyi asserts this objective reality, which transcends sensory perception, because he is forced to do so as a result of his argument. Such a conclusion seems to him to be the only way out of the logical dilemmas resulting from the positivistic conception. These dilemmas prove to him that, far from asserting the existence of objective

knowledge, the positivist is forced into a position of asserting the impossibility of knowledge altogether. Since he can "know" this, knowledge is therefore possible, and the positivists must be wrong.

Moreover, the positivist finds himself having to declare meaningful the only things which can have no meaning in themselves: the "particulars" of which we are only focally aware. These things acquire meaning only in a subsidiary context, and thus only when we have made the personal commitment to subordinate tangible things to things of a higher, more coherent order. As he puts it:

What is most tangible has the least meaning and it is perverse to identify the tangible with the real. For to regard a meaningless substratum as the ultimate reality of all things, must lead to the conclusion that all things are meaningless. And we can avoid this conclusion only if we acknowledge instead that deepest reality is possessed by higher things that are least tangible. (10)

Since personal commitment is required for the apprehension of these superordinate realities, and since this commitment occurs in the context of personal skill, it is appropriate to refer to the process as "visionary". Knowledge of reality comes not simply as the result of observation and logical analysis. We cannot expect to form ourselves into logic machines,

feed observations into a hopper, and draw conclusions which we may call knowledge. All this is mere prelude to the grand act of personal commitment to a vision.

Although it is not defined by them, this vision cannot, of course, contradict those subsidiary particulars of which we are aware in the formulation of the vision, just as a picture in a newspaper does not cease to be composed of hundreds of tiny dots once we decide to view it as a picture. However, we cannot use our awareness of the dots to claim that our perception of the picture is true. Therefore, we may still feel uncomfortable with this notion of a vision -- how can we be certain that the picture we perceive is the "real" one, for illusions surely do exist? As R. J. Brownhill asks,

... how can we know whether a vision is true when we cannot test it by the experience of our senses, and can we really call a vision knowledge at all if we cannot test it? (Brownhill, 1960: 121)

Kant would say that we cannot test such visionary knowledge, for this would amount to a test of knowledge of a thing in itself, which is beyond sense, and therefore this knowledge does not strictly deserve to be called knowledge. Moreover, those who would insist that such propositions must be conclusively verified or

falsified in order to be called knowledge must also maintain that such visionary knowledge as Polanyi proposes is not in fact knowledge. (11)

In this absence of physical tests for metaphysical principles, Polanyi therefore insists that a practicing scientist be an especially moral man, obliged at all times to tell the truth about what he has discovered about reality, and responsible for and committed to the discovery he has made. (Brownhill, 1960: 122) Thus it is that commitment, faith, skill, and vision are necessary for the scientific process to continue. The vision of the scientist is not tested against some observation statement referring to empirical reality in Popper's sense. Rather, this vision, which is a belief, a faith, is tested against the faith of the scientific community, the beliefs and visions which the community has already accepted.

Two objections can be immediately raised here. It is evident, first of all, that reliance upon the accepted knowledge of the relevant scientific community runs a serious risk of dogmatism. The scientific community can be as wrong as any individual scientist, and the requirement that a vision be tested against that of the community might insure that untruth would become unassailable, making science impossible.

Furthermore, the fact that one "vision" can be replaced in standing by another indicates that no vision, including Polanyi's own vision of consciousness and knowledge, can ever be said to be true with certainty.

The second objection is the less serious of the two, I believe, for it is beside the point of Polanyi's analysis. In fact, it is precisely his argument that does most to establish the uncertainty of knowledge. It is the positivist, he contends, who seeks the impossible dream of certain knowledge, with his denial of personal commitment. The positivist notion of objectivity was established to aid in the acquisition of certain knowledge. But we must not confuse objectivity with certainty. If the objectivity of knowledge means having a basis outside of the individual knower, then Polanyi may claim that knowledge may be objective and yet uncertain.

The problem of dogmatism is more difficult to overcome, and Polanyi admits this. Indeed, the current positivistic dogmas in science have done much more, in his view, to damage true science than anything else. (Polanyi and Prosch, 1975: 24) The only way out of the difficulty is to insist on the primacy of virtue and morality in scientific affairs. The virtuous scientist is not personally committed to a proposition, he is

committed to the pursuit of truth, and because of this commitment, is entirely willing to discard particular propositions in the interest of this latter pursuit. Indeed, the commitment to this or that proposition represents an inversion of the proper scientific attitude, much as the commitment to a particular methodology represents an inversion of the scientific process as seen by Eric Voegelin. And this attitude of virtuous commitment must predominate in the entire scientific community if dogmatism is to be avoided. But because of the reliance upon personal commitment, such virtue can never be guaranteed, and it is always possible for science to degenerate into dogmatism. This may be too bad, but that is just the way it is, and no amount of methodological tinkering can insure against it.

This is somewhat akin to Popper's methodological principle that the game must never end, but it is more than a rule for successful science: it is a part of the vision of higher reality itself. The scientist must constantly seek the truth, he must personally commit himself to do so, and this principle is itself part of the truth being sought. Virtue and knowledge are inextricably linked, science and metaphysics are inseparable, fact and value are one.

We will now see that Eric Voegelin is of a similar mind.

The New Science of Politics

One of Voegelin's early attempts at explaining his analysis of politics and history dealt directly with the subject of the state of the scientific study of politics. In 1951, when he delivered the Walgreen lectures at the University of Chicago (published in 1952 as The New Science of Politics), the "statistical, the psychological, and the sociological bases of a political science" had reached the high point of their challenge to the more traditional modes of political inquiry. (12) This challenge was itself being challenged, however, and by 1952 Voegelin's work represented perhaps one of the more articulate and telling parts of this counterattack.

A theory of politics, says Voegelin, if it is to penetrate to principles (as any theory must), must at the same time be a theory of history. He recognizes that such an approach is not the usual in contemporary political science, but nevertheless,

the procedure cannot be considered an innovation in political science; it will appear rather as a restoration, if it be remembered that the two fields which today are cultivated separately were inseparably united when political science was founded by Plato. (Voegelin, 1952: 1)

The connection between political science and the study of history is not generally recognized, especially during times which are relatively untroubled. During such historical periods of comparative stability, political science "contracts" to the mere description of existing institutions, and the apology for the principles of these institutions. (13) It is only during times of extraordinary historical crisis that the fullness of the connection between political science and history becomes articulate. Voegelin notes that there have been at least three such crises in Western history: the Hellenic crisis, marked by Plato and Aristotle, that of Christianity and Rome, marked by Augustine, and the great "Western crisis", marked by Hegel's philosophy of history and law and its derivatives.

Voegelin cautions that any return to an examination of theoretical principles in political science (and a move away from simple apologetics) cannot be had by simply returning to the formulations

of earlier times -- whether these formulations be Platonism, Augustinianism, or Hegelianism. We can certainly learn from previous attempts to treat the problems involved in theorizing, but

the very historicity of human existence, that is, the unfolding of the typical in meaningful concreteness, precludes a valid reformulation of principles through return to a former concreteness. (Voegelin, 1952: 2)

There is nothing to be gained, and a good deal to lose, by denying the very historical nature which one is attempting to examine theoretically. The concrete experience of another age can serve as example, but it can never afford us the existential experience necessary for an adequate formulation of the problems which must be approached by political science. This is of course identical to Popper's contention that the context of history provides us with concrete social problems towards which all scientific investigation must be directed. The very historical nature of these problems makes them concretely different problems, although various similarities can nevertheless be recognized. (14)

What is needed then is not a return to an earlier way of doing things, but a new awareness of the problems and importance of theory, and a new

willingness to undertake the job of "doing theory". This retheoretization has been taking place in political science for some time, according to Voegelin, and may be understood as a response to the disastrous and destructive effects of two fundamental assumptions underlying the positivistic bent of most current political science: (1) that the methods of the natural sciences are applicable to a science of human society, and (2) that these methods are the defining characteristics of a valid science and are "a criterion for theoretical relevance in general."

The problems with the first assumption are relatively well-known, and Popper has shown us why the assumption cannot hold water. According to Voegelin, this assumption should not be all that problematic, for if the methods truly do not work -- if they produce "bad science" as Popper claims -- then the poor results of any inquiry directed by such methods would prove their inapplicability. (15) It is the second assumption which causes most of the real difficulty. For by defining science in terms of a type of method, a strange and destructive inversion has taken place:

... this second assumption subordinates theoretical relevance to method and thereby perverts the meaning of science. Science is

a search for truth concerning the nature of the various realms of being. Relevant in science is whatever contributes to the success of this search. Facts are relevant in so far as their knowledge contributes to the study of essence, while methods are adequate in so far as they can be effectively used as a means for this end. Different objects require different methods This may sound trivial, but disregard for elementary verities happens to be one of the characteristics of the positivistic attitude; and hence it becomes necessary to elaborate the obvious. (Voegelin, 1952: 4-5)

Voegelin wishes to distinguish between a particular manifestation of this latter problem, and the problem of perversion of science in general. In this general sense, his claim is that any attempt to bind science to a particular method in principle perverts the meaning of science and makes its practice impossible. (16)

We must pay close attention to this general form of the perversion, and distinguish it from the particular ways in which it has come about. Failure to make such a distinction would not allow the analysis of the perversion to penetrate to the level of principle. For example, if we were to define positivism simply as the doctrine taught by Ayer, and attempt to discuss positivism as a perversion of science, our investigation would fail to recognize related forms of the perversion, for we would not examine the principle of perversion behind the special form of Comtean

positivism. Similarly, if one construed positivism as being the development of social science through the use of mathematizing methods "one might arrive at the conclusion that positivism has never existed" for this development has even now not been fully completed. (Voegelin, 1952: 8) But if, on the other hand, positivism were treated as the attempt to make social sciences truly "scientific" by subordinating it to the methods used in natural sciences, entire areas open themselves up for investigation.

Understanding positivism in this sense, Voegelin notes various ways in which the phenomenon manifests itself. First of all,

[t]he use of method as the criterion of science abolishes theoretical relevance. As a consequence, all propositions concerning facts will be promoted to the dignity of science, regardless of their relevance, as long as they result from a correct use of method. (Voegelin, 1952: 8, my emphasis)

The result of this is an enormous proliferation of facts, and especially of irrelevant facts. Lacking the "quality control" of theoretical relevance, irrelevant facts will eventually overwhelm those that are relevant for, as Popper has shown us earlier, facts relevant to a concrete problem are few in number, while there are an infinite number of facts in total. Faced with this

situation, science will simply choke itself to death on useless and irrelevant information.

An interesting corollary seems to apply here. What both Popper and Voegelin seem to be saying is that although science is the pursuit of truth, this is not the end of the matter: it must be the pursuit of relevant truth. Even granting that the relevance of a discovered truth may not be immediately apparent, it is clear that the complete disregard of relevance leaves the practice of science pointless. Yet this pointlessness will be achieved only by the proliferation of practicing scientists. We then are faced with the situation in which large numbers of highly-educated and skilled people must turn elsewhere to find any meaning in what they do. It is easy to imagine what the result might be: "science" practiced not in pursuit of truth at all (relevant or otherwise), but rather in pursuit of status, ideology, or funding. We may also expect to see a massive proliferation of arcane specialities which do not communicate with each other except to compete, and which have relevance only in their own eyes. (17)

Related to this uncritical equality of facts is the second manifestation of positivism: the examination of truly relevant information under

defective theoretical principles, something which is bound to happen due to the neglect of theory. In the field of historical analysis especially, Voegelin notes examples of great efforts in the accumulation of truly important materials going to waste simply because the scholar had nothing theoretically relevant to do with the materials once they were collected. The use of non-theoretical, and hence uncritical, principles of interpretation prevents the scholar from recognizing certain essential parts of the historical picture, and this in turn prevents the facts which he does recognize from assuming their true importance. (18)

A third manifestation of positivism also comes under critical attack by Voegelin. Under this aspect, Voegelin analyzes the development of methodology, which occurs especially in the half-century from 1870 to 1920 (Voegelin, 1952: 10) This development resulted directly from the perversion of theoretical relevance which is generally a condition of the positivistic attitude, but it also, according to Voegelin, contained within it the seeds of positivism's destruction, inasmuch as "it generalized the relevance of method and thereby regained the understanding of the specific adequacy of different methods for different sciences." (Voegelin, 1952: 11) In other words, the emphasis upon

methodology eventually led back to the realization that appropriate and effective methodologies could only be developed in the context of a particular science, and that quite often one methodology which was applicable to one science would not prove to be applicable to another. The question then becomes one of how one would go about establishing critical standards for the appropriateness of a methodology, and the minute such a question is asked, the very idea of a science defined as a methodology is refuted. ...

Voegelin and the "Fact-Value" Distinction

Voegelin shares Polanyi's concern about the attempt by the positivist tradition to make political science "objective" through the methodological elimination of all so-called "value judgements". Voegelin does not believe that the distinction between objective reality and "values" is a valid one, and he bases part of his case against it upon an analysis of the history of this distinction.

First of all, he says, we must realize that the terms "value judgement" and "value-free" science were not a part of the philosophical vocabulary until the late nineteenth century --- that is, until the advent

of the positivist movement in social science:

The notion of a value-judgment (Werturteil) is meaningless in itself; it gains its meaning from a situation in which it is opposed to judgments concerning facts (Tatsachenurteile). And this situation was created through the positivistic conceit that only propositions concerning facts of the phenomenal world were "objective", while judgments concerning the right order of soul and society were "subjective". (Voegelin, 1952: 11)

The separation of fact from value had two distinct and somewhat ambivalent effects: on the one hand, rigorous methodology designed to purge political science of residual "values" had the effect of directing attention to the problems of uncritical opinion and of dogmatic attitude. That is, the fact-value distinction brought to the fore the realization that there truly was a difference between attitudes and decisions based upon "truth", scientifically discovered and critically held, and "opinion" --- value-oriented assumptions with no justifying facts to back them up.

To the extent that the distinction encouraged the awareness of this difference, it enhanced the possibilities of science by allowing its distinct nature to be separated out from uncritical opining. Popper's work can be seen as an attempt at such a

separation, and Voegelin's work is constantly concerned with just this problem. But on the other hand, to the extent that the fact-value distinction served to relegate whole approaches to the study of political science, approaches which well deserve the claim to empirical validity (such as classical philosophical anthropology and the study of ontology) to the rubbish heap, it also exacerbated any chances that social science might have had for avoiding the "morass of relativism" into which it found itself sinking. (Voegelin, 1952: 13) With the rejection of the notion that there could be any science of "values", all critical study of a "right order" of human society and the human soul was pushed aside, along with all consideration of values and ends. Moreover, since values were considered to be unquestioned assumptions of research and analysis, there was consequently no way to avoid having as many different analyses, as many different political sciences, as there were researchers with different values.

The Example of Max Weber

This problem of the fact-value distinction comes to a head in the works of Max Weber, according to Voegelin, for Weber elevated the distinction to a critical point. He was quite explicit in his declaration that science involved only the examination of causes and effects, and that values as such were completely outside of the realm of science. Which actions were good and which were bad could not be told by Weber's science. Instead, such a science would provide a list of the consequences which a particular action might have (would have), and leave it up to individual choice to decide whether or not to take such action. Values as such are "demonic" and are beyond rational argument and critical examination. It was the task of political science, especially a science of public administration, to make political actors aware of the consequences of their actions, and thus to soften the demonism in politics and introduce instead an element of "responsibility".

This notion harkens back to the first ambiguous consequence of the "value-free" science: a concentration on the distinction between uncritical

opinion and belief related to scientifically ascertained fact. But Voegelin finds that giving a purpose to science in this way is actually contradictory to the expressed nature of science itself. In assuming that the scientist would teach the politician the consequences of his actions, Weber must necessarily admit that this act of teaching had some purpose behind it. Why should people be taught these things? Since the values of the students were beyond scientific analysis, this teaching would apparently leave them untouched:

Could it perhaps have the indirect effect of inviting the students to revise their values when they realized what unsuspected, and perhaps undesired, consequences their political ideas would have in practice? But in that case the values of the students would not be quite so demonically fixed. An appeal to judgment would be possible, and what could a judgment that resulted in reasoned preference of value over value be but a value-judgment? Were reasoned value-judgments possible after all? The teaching of a value-free science of politics in a university would be a senseless enterprise unless it were calculated to influence the values of the students by putting at their disposition an objective knowledge of political reality. Insofar as Weber was a great teacher, he gave the lie to his idea of values as demonic decisions. (Voegelin, 1952: 16)

Could Weber finesse this argument by claiming that

it was simply human nature to try to inculcate his own demonic values in fresh young minds, that these values might be given greater chance of realization in public policy? No --- for this is not the point of the argument. Weber does not simply set his own demonically held values in opposition to those of his students, and then let it go at that. He argues for them. He gives evidence for them: reasons, in the form of the effects of policy decisions, why students should choose one course of action over another. And it is this attempt to influence the values of his students which leads Voegelin to believe that Weber was inconsistent in his notion about demonically-held values, for if values were indeed demonic, the idea of rational argument in support of any value would make no sense whatsoever.

There is a further sense in which Weber's scholastic work is inconsistent with the principle of a separation of science from values, according to Voegelin, and this can be seen when one examines Weber's work on history. The main problem with writing a history is that there are potentially an infinite number of historical facts, which must be winnowed through the use of some sort of framework, as Popper has noted. Now Weber, with his exclusion of values

from objective investigation, could not theoretically defend a "science of order", nor prevent scientific analysis of history from degenerating into relativism (neither can Popper). Yet he himself escapes this fate by introducing principles of order into his analysis of history "as facts and causal factors in history." Voegelin gives an example of this technique:

While Weber as a methodologist of value-free science would profess to have no argument against a political intellectual who had "demonically" settled on Marxism as the "value" of his preference, he could blandly engage in a study of Protestant ethics and show that certain religious convictions rather than the class struggle played an important role in the formation of capitalism. (Voegelin, 1952: 18)

What Weber accomplishes in doing so is the creation of an argument against Marxism, by noting the objectively observable fact that an historical analysis based upon Marxist principles leads to incorrect conclusions.

Note that this does not depend upon whether Weber was actually correct in his analysis of history, and thus a Marxist attempt to explain away religious influence as epiphenomenal would be irrelevant to the main point here, no matter how accurate it might be as a description of historical reality. It would just shift the burden of changing values to Weber. The

important point for our purposes is that Weber's "objective" interpretation leads to the realization that certain interpretations of history are wrong, and therefore there must be a standard of objectivity in science which "preclude[s] the constitution of the object of science by 'referring' facts and problems to the 'value' of a Marxist" or to any other "demonically" held system of values. (Voegelin, 1952: 19) If there exist objective facts in history which contradict "values" used as assumptions for analysis, then these values may be demonstrably shown to be wrong, and therefore a science of values (or of "order", in Voegelin's terms) is possible.

Neither can this argument be finessed by saying that Weber's interpretation of what is relevant in history is a function of his own demonically-held values -- for this is again entirely beside the point. We are concerned with the natural inconsistency to which Weber's position leads him. In the non-subjective, scientific study of history, a study presumably divorced methodologically from his own values, Weber uncovers certain objective facts which may serve as critical standards for the evaluation of values. This is the crucial point: facts and arguments can and do influence values held by people,

and to the extent that they do, these values are not arrived at "demonically", but through rational investigation and speculation in the light of standards of truth which are considered to be objective. In Popper's words, World 2 must remain open to World 3. This behavior is by definition scientific, and thus Weber seems to be missing the applicability of science to personal values. Values are not just starting points for scientific investigation -- they are also arrived at in the form of conclusions through reasoned discourse.

Why such considerations never led Weber to reject his formulation in favor of a "science of order" may never be known, but Voegelin believes that it is possible to discern the point at which he stopped his investigation. Voegelin finds it significant that in all of Weber's massive work on the history and sociology of religion, there is no examination of pre-Reformation Christianity:

The reason for the omission seems to be obvious. One can hardly engage in a serious study of medieval Christianity without discovering among its "values" the belief in a rational science of human and social order and especially of natural law. Moreover, this science was not simply a belief, but it was actually elaborated as a work of reason. Here Weber would have run into the fact of a

science of order, just as he would if he had seriously occupied himself with Greek philosophy. (Voegelin, 1952: 20)

However, this science of order must be ignored in a work such as Weber's, since

[I]n order to degrade the politics of Plato, Aristotle, or St. Thomas to the rank of "values" among others, a conscientious scholar would first have to show that their claim to be science was unfounded. And that attempt is self-defeating. By the time the would-be critic has penetrated the meaning of metaphysics with sufficient thoroughness to make his criticism weighty, he will have become a metaphysician himself. The attack on metaphysics can be undertaken with a good conscience only from the safe distance of imperfect knowledge. (Voegelin, 1952: 20, my emphasis)

Weber's position, Voegelin concludes, reduces the notion of a value-free science ad absurdum. A scientist can believe that the object of science is constituted by reference to some prior value only so long as he does not treat all values as being equal. Weber not only treats them as all equal, he treats them as "social facts among others". In this situation, "there were no 'values' left which could constitute the object of science, because they had become part of the object itself." (Voegelin, 1952: 20-21) Political science had reached the limits of its positivistic line

of argument.

It then became necessary, according to Voegelin, for a restoration to begin to take place, one which would involve political science in an active reaffirmation of the possibilities of a science of order and essence, of science as a pursuit of a truth which is constituted entirely independently of human "values". The lectures in The New Science of Politics represent his own attempt to engage in this restoration through a discussion of the problem of representation in political society. We will accordingly turn to this now.

The Representation of Existence (19)

"Human society", writes Voegelin, "is not merely a fact, or an event, in the external world to be studied by an observer like a natural phenomenon." (Voegelin, 1959: 27) The face which society presents to the outside world, and which constitutes its "merely factual" nature, is indeed an important part of that society's existence, and is therefore an important object of study for those interested in man and his

relationships. But equally important, and perhaps more so, is the face which society presents to itself; that is, the manner and substance of society's expression of the meaning of its existence and its place in the order of things. For society is more than an object to be witnessed:

... it is as a whole a little world, a cosmion, illuminated with meaning from within by the human beings who continuously create and bear it as the mode and condition of their self-realization. It is illuminated through an elaborate symbolism, in various degrees of compactness and differentiation -- from rite, through myth, to theory -- and this symbolism illuminates it with meaning in so far as the symbols make the internal structure of such a cosmion, the relations between its members and groups of members, as well as its existence as a whole, transparent for the mystery of human existence. (Voegelin, 1959: 27)

A society carries with it the meaning of its own existence, as understood and determined by the members of that society, and this understanding is both achieved and communicated through the use of certain symbolic forms of expression. Voegelin terms this understanding and communication the "self-illumination" of a society, and it is a dynamic, ongoing process, occurring as members of a society continually translate their experience of the depth of individual and social

existence into communicable language symbols. One symbol which can serve this function is the concept of political representation.

Political societies may be considered in both their internal and external aspects. Externally, we refer to the fact that societies exist tangibly through the medium of physical human bodies which participate "in the organic and inorganic externality of the world": Popper's "World 1". (Voegelin, 1959: 31) As opposed to considerations of common mores, beliefs, or values, we here refer to the actual physical presence of a group of individuals organized in some manner according to more or less codified and formal rules. A society can, for example, lose its form not only through the internal dissolution of the beliefs and symbols which give it its cohesiveness and self-understood identity, but it can also obviously be destroyed through the dispersion or outright destruction of its members. This is the type of externality which Voegelin has in mind when he speaks of the "theoretically elemental aspect" of representation. (Voegelin, 1959: 31)

This elemental or "constitutional" representation is what we are dealing with when, for example, we speak of the United States and other Western nations as

having "representative institutions". We here refer to nothing more than "simple data of the external world", usually meaning that the officials of the government hold their positions by virtue of some type of popular election, and we bring into our discussion such topics as voting behavior, elections, lobbying, political party activities, and the behavior of public officials. The study of the elemental aspects of representation comprises, in our view, most of what goes on in mainstream political science today. This is not to belittle such studies, however: far from it. For we keep in mind that this aspect of representation, while perhaps containing only moderate theoretical relevance, nevertheless carries some, for the elemental aspects of society are yet part of its total structure. (20)

We can see that the theoretical relevance of the concept of representation is not exhausted by its elemental aspect when we realize that a group, a society, may be considered representative in one sense, yet not in another. Under the elemental aspect, we speak of a society as being representative of its members through its formal laws, official policies, and recognized structures and institutions, and we most often mean by this interpretation that these aspects represent the interests of an appropriate group of

people. Yet there can be vast disagreement over what constitutes the representation of the people's interest. Voegelin notes, for example, the sharp division of opinion between Western democrats and Soviet Communists over the question of whether or not the Soviet Union is truly representative in this sense:

Westerners will say that the mechanism of representation alone will not do, that the voter must have a genuine choice, and that the party monopoly provided by the Soviet constitution makes a choice impossible. Communists will say that the true representative must have the interest of the people at heart, that the exclusion of parties representing special interests is necessary in order to make the institutions truly representative, and that only countries where the monopoly of representation is secured for the Communist party are genuine people's democracies. (Voegelin, 1959: 34)

And this is by no means the only conflict which occurs over the question of what type of institutional arrangement may be considered truly representative: arguments abound not only over the number of parties necessary for adequate representation, but also over the types of elections, suffrage rights, questions of centralization and fragmentation of power, and qualifications of officials.

However, says Voegelin, though we might disagree as to whether or not the government of the Soviet Union

actually represents the people, "there can be no doubt whatsoever that the Soviet government represents the Soviet society as a political society in form for action in history." (Voegelin, 1959: 36) As a result of what Voegelin calls "political articulation", (21) society has rulers, which are given the ability to act for society in both an international and a domestic context, and whose acts are not considered to be merely the acts of private individuals, but are instead perceived as being representative of the society as a whole. The purpose of such representation is to procure for society, through the action of its representatives, its "existential necessities" -- those things which it finds essential for its existence -- and thus Voegelin terms this aspect of representation its "existential" aspect.

These two types of representation might be grouped together under the "representation of existence", for it is through the use of elemental and existential representation that society represents the existence of its members to itself and to the rest of the world. Yet just as a society has more than simple externality, and additionally aspires to self-understanding, so too representation has a facet to it which goes beyond the elemental and existential.

The Representation of Transcendence

In interpreting and communicating the meaning of its existence, a society has recourse to the use of symbols, and insofar as symbols are meant to represent this meaning, they are also meant to be true, as Polanyi notes. (Voegelin, 1959: 52) Just as we may distinguish between explicit and tacit knowledge, we may also distinguish between the representation of a society by its "articulated representatives" and "a second relation in which society itself becomes the representative of something beyond itself, of a transcendent reality." (Voegelin, 1959: 54) Voegelin therefore terms this type of representation "transcendental". (22)

Now it is surely true that while one society may consider the symbols which it generates to be representative of truth and meaning, another society or individual may not accept the former's interpretation. Rather, the second may oppose its own truth to that of the first. When this happens, they become enemies, for the "sacredness" of truth, and the required personal commitment to it, causes the "possessor" of truth to view those who would challenge it as representative of

disorder and untruth, and hence dangerous adversaries.
(Voegelin, 1959: 55)

The notion that the truth represented by a society can be challenged by another society or an individual points out an important fact. (23) Although we speak of "society" representing itself and a transcendent source of order and truth, this must be understood as merely shorthand. For "society" does not perform conscious actions: it does not experience, perceive, understand, symbolize, or communicate. Conscious activity is the work of conscious beings, and consciousness resides in concrete individuals, rather than in any abstracted, higher level of existence.
(24)

It is this fact, that the locus of consciousness is the concrete individual, which accounts for the necessity of representing truth, that is, symbolizing it instead of giving it a literal expression. The concept of the individual is itself a symbolic expression of the experience of existence, according to Voegelin (1978: 175-182), and the differentiation of this individual from the general field of consciousness was the achievement of classical Greek philosophy and its immediate precursors. (Voegelin, 1957, 1957a)
Voegelin's understanding of the nature of human

existence and consciousness is largely derived from this classical understanding, as expressed especially by Plato, and it revolves around what he calls the "In-Betweenness" of existence.

Symbolism and Metaxy

For Voegelin, it seems, the primary experience of existence is the experience of tension. (Webb, 1981: 38) Although we do not find Plato using this precise term, we do find the experience expressed through his frequent introduction and use of concepts which are dualistic (philosopher v. philodoxer, knowledge v. ignorance, good v. evil, etc.) and most importantly through his exposition of the idea that human existence occurs "In-Between" (metaxy) Being and Not-being. Two great expositions of this concept occur in the discussion of Knowledge and Opinion in Book V of the Republic, and in the analogy of the puppet in the Laws.
(25)

To take the latter first, in the Laws (644d-645b), Plato imagines men to be like marionettes, with various cords attached to them, pulling them in different

directions; thus accounting for the various desires which we all feel in this life, as well as the tensions of life, since the cords often pull us in opposite directions. One of these cords is made of gold and is sacred: it is this cord which connects us "erotically" (26) to the Divine transcendent ordering ground of Being. Its pull is delicate and gentle. The other cords, however, are made of iron and are considerably stronger, and man must resist the pulls of these cords, which are the pulls of "this world", in order not to be drawn away from the Divine by them. He must "pull back" against these cords in order to support the slender golden thread and to allow himself to be ordered according to the Divine patterns of the ground of Being.

Plato uses this as an object lesson in the proper behavior of a citizen of the polis and of the polis itself. He is emphasizing the "pulling back". Voegelin, however, is more concerned with the nature of existence for Plato, and sees from this analogy that man exists "metaleptically", (27) participating in the In-between of Divine and mundane worldliness, and man experiences this fact through his consciousness of the tensions of existence. Human existence and its tensions are the givens of reality -- they are what we

experience and they account for how we experience. The proper response to this for man is, according to Plato, a humble and creaturely submission to the "serious play" of the gods, and the acceptance of this reality.

What effect this type of existence has on the possibility of knowledge can be seen in Book V of the Republic, in which Socrates and Glaukon discuss the difference between knowledge (episteme) and opinion (doxa), in an attempt to establish a true conception of what philosophy entails. It is first asserted by Socrates that philosophers are desirers of wisdom, and of all wisdom. (474b) This is readily agreed to by Glaukon, but he suspects that there is more to it, for he notes that lovers of sights and sounds are often so because they love learning, and we are hardly willing to grant them status as true philosophers. (475d) Socrates agrees, and explains how he makes the separation between lovers in general and lovers of wisdom.

As an example, Socrates distinguishes first of all between taking delight in things which exhibit or "participate in" the quality of beauty and taking delight in Beauty itself. Furthermore, he will distinguish between that type of man who believes in and loves the former but not the latter, and the type

of man who believes in and can discern the existence of both. (476bd) Now the former type of man will be like a dreamer, since dreaming is no more than "believing a likeness of something to be not a likeness, but rather the thing itself to which it is like." (476c) But the latter type of man, the one who can distinguish Beauty from that which is merely beautiful, and who does not confound the one with the other, will be the man who is truly awake. This is the man who truly possesses knowledge, while the other opines, and does not know.

Knowledge must be knowledge of something, and this something must necessarily be something which is and not something which is not. (477a) That which is is knowable and that which is knowable is. Thus, true knowledge pertains only to the realm of Being, that realm which circumscribes that which is. Furthermore, that which is not is unknowable, and that which is unknowable "in no way is." Ignorance, then, pertains to the realm of Not-being. (477b) Where then does doxa fit in? Opinion, we will find, lies in between knowledge and ignorance, and that of which it opines, between that which is and that which is not. (487e,ff.) (28)

It is then agreed by Socrates and Glaukon to assign the term "philosopher" only to those who love

true wisdom, to those who will love and seek that which is. Those who delight in that which "roll[s] around somewhere between Not-being and Being purely and simply" (479d) shall deserve the appellation "philodoxos": lovers of opinion. (29)

Voegelin's conception of the nature of existence is substantially similar to that of Plato. (See esp. Voegelin, 1978) There are certain requirements and restrictions which this conception of existence places on human expression and the ability to claim knowledge. For though man experiences, and hence participates in, both Being and Not-being, he is himself neither wholly of the one nor the other. Being and Not-being are the boundaries of existence within which human consciousness can occur and move, this movement occurring as a response to the erotic attraction mentioned above. As boundaries, they are perceived as that beyond which consciousness cannot go, and are therefore part of the experience of consciousness. And yet they cannot be subsumed within consciousness itself, else they would not perform the function of boundaries. In other words, man cannot have certain or complete knowledge, and in this sense cannot be termed "wise":

Wise I may not call them; for that is a great name which belongs to God alone -- lovers of wisdom or philosophers is their more modest and befitting title. (30)

For Plato and for Voegelin, man may only aspire to be a lover, a seeker, of wisdom, and nothing more, for to claim more is to claim godhood and thus to deny our humanity. Popper's game of science indeed must never end. Like Popper, knowledge must always be uncertain, and like Polanyi, there are metaphysical reasons for this. Nor are we completely ignorant -- we know that we do not know -- for this would also deny the special In-between nature of existence. We do know, but as Polanyi puts it, we always know more than we can say.

Owing to this peculiar situation in which man finds himself, afloat somewhere between Being and Not-being, symbolic representation of two different types plays a large part in understanding and communication. The first type of symbolic representation is well known to all: it is the simple act of representing, through the use of language, the phenomena of everyday, quotidian experience. It is the act of naming and defining, associating particular phonemes with particular objects of our experience of World 1, and regulating the use of these phonemes by calling some phonemes and combinations of phonemes

"meaningful". (31) What is represented under this aspect is generally said either to be or to derive from sensory experience of physical phenomena. Since consciousness is always the consciousness of a concrete individual, these direct experiences cannot be directly experienced in a precisely similar way by different individuals, or at least, different individuals can have no direct experience of any such similarity. Matching phonemes with experiences in naming processes, and in subsequent defining processes, provides us with the opportunity to symbolize our experiences in ways which are communicable across discrete individuals.

(32)

While the positivist would rest with this point, Voegelin would assert metaphysical limits to this type of experience. Furthermore, this experience of "boundedness" must also be symbolically represented. Yet since the experience of the transcendent is "once removed" from general experiences of the field of consciousness (note that both experiences yet occur within said field, even though one experience is of something "outside"), the symbols adequate for the representation of the latter will be seen to be inadequate for the task of representating the former. We feel safe in using language terms to discuss

everyday occurrences, even though we often admit that the names do not capture the essences of the things named. We are willing to put up with imprecision for the most part, because we feel that we may still capture the essence in our minds. If someone asks us what type of thing a dog is, we may have difficulty formulating an answer which expresses with precision our conception of that animal, but this is due to the fact that we nonetheless feel that we know what a dog is. We know it so well that language seems almost a poor vehicle for the expression of this knowledge.

But what are we to do with the very boundaries of our "knowledge", with the "Ineffable Greatness", the "inherently and eternally Unknowable", "YHWH", "the Dabar", "Logos", "the One Great Life", "Being and Nothingness", "that which comprehends all, and hence cannot be comprehended"? Faced with something on this order, mere naming seems to us woefully inadequate. Symbolization of such radically more complex experiences requires similar complexity in expression, says Voegelin. We may not be content with names and definitions, but must move on and incorporate these into larger, more comprehensive symbols: those of myth, religion, philosophy --- and science.

* * *

The fact that we construct symbols -- that we can only symbolize -- links Voegelin's metaphysics to that of Polanyi, and perhaps provides the basis lacking for a final acceptance of Popper's critique of positivism and historicism. We must symbolize because our knowledge is incomplete, bounded by our placement in the structure of reality. Symbols are symbols, and not literal expressions of truth. Thus, the pursuit of truth is never finished -- the game is never over -- it is a process that must continue throughout the span of our lives. The release of political science from positivistic and historicistic demands for certain knowledge can be understood as part of a commitment to such a view of reality and conversely, only with such a commitment can such a release be effected.

(1) Originally presented in American Scholar, 35, 1966, pp. 261-276. Reprinted in Polanyi, 1969: 24-39.

(2) Polanyi extracts this interesting metaphor from a poem entitled "Song of Faith", by Dimitar Metodiev, a leading Bulgarian Communist. The poem begins with the line

If one had told me yesterday:
 -- Friend take off your glasses! --
 I would have laughed
 in a black rage
 at the mortal insult.

and continues:

On the ground now
 the glasses lie smashed
 and I look at them stunned.

The poem was published in the official party organ of Bulgaria in January 1962, and describes "the great change that by this time was universally imposed by the party", referring to the repudiation of Stalin. (Polanyi, 1969: 30)

(3) As in the final passage of The Poverty of Historicism cited at the end of Chapter 3 in this work.

(4) We have seen in Chapter 5 why all such systems, and indeed all frameworks, are "necessarily incomplete".

(5) These arguments are to be found in Polanyi, 1969: 33-35. If the moral neutralist were to counter that universality is not intended by the person making a moral judgement, we may refer him to the arguments against relativism found in the previous chapter.

(6) The first of the Lindsay Memorial Lectures delivered by Polanyi at the University of North Staffordshire in 1958. Reprinted in Polanyi, 1959.

(7) As Voegelin will say, any methodology which occludes or denies a fundamental human experience serves no purpose, and in fact does precisely what a methodology should not do.

(8) Thus, Popper tells us that there are an infinite number of true mathematical theorems. The skill of the scientist consists in discerning those which are "interesting". Cf. Popper, 1968.

(9) Some of the rules are known, or course, and must be obeyed. If this were not so, there could be no coaching or teaching. What Polanyi is emphasizing is simply that great scientific performances can be formulated and taught no more easily than great artistic or athletic ones. Furthermore, as anyone who has ever tried to hit a curve ball knows, focal concentration on the minute details of a technically correct performance will prevent the correct performance -- you will miss the ball. And in any case, knowledge of all relevant details is in the limit impossible, for the circumstances leading up to any event are infinite in number.

(10) Michael Polanyi, "The Modern Mind: Its Structures and Prospects". Lecture delivered October 19, 1964, at Bowdoin College, Brunswick, Maine. Cited in Brownhill, 1960: 118.

(11) Of course, as we have seen, conclusive verification or falsification is an impossibility. Therefore, this position degenerates into one of declaring that no knowledge exists, a proposition which contradicts itself.

(12) From Jerome Kerwin's "Forward", in Voegelin, 1952: v.

(13) Thereby becoming more a "profession" than a "discipline".

(14) This in turn reminds us of earlier discussion of the analytical problems which may arise in the consideration of unique historical events.

(15) However, this inapplicability would be "proven" only to those who are emotionally or psychologically willing to change frameworks, and these are not necessarily the ones whose minds really need to be changed.

(16) The subjugation of science as an ongoing pursuit to a particular idealized methodology effects exactly the ending of the scientific game which Popper

so strongly criticizes. Thus, Voegelin's analysis coincides with Popper's here.

(17) One anecdote must be permitted here. I recently heard of a radio interview with a scientist who had spent a grand part of his professional life studying "bee undertakers" -- those bees in a hive whose purpose it is to remove dead bodies. When the interviewer asked a truly relevant question, "Why in the world did you decide to study this?", the scientist's response was that he was simply curious, and that was good enough. Presumably, he is now a world-renowned expert in his chosen field.

(18) A rather extended quotation will serve to illustrate this tendency:

Into this class belong the histories of Greek philosophy which from their sources primarily extracted a "contribution" to the foundation of Western science; the treatises on Plato which discovered in him a precursor of Neo-Kantian logic or, according to the political fashions of the time, a constitutionalist, a utopian, a socialist, or a Fascist; the histories of political ideas which defined politics in terms of Western constitutionalism and then were unable to discover much political theory in the Middle Ages; or the other variant which discovered in the Middle Ages a good deal of "contribution" to constitutional doctrine but completely ignored the block of political sectarian movements which culminated in the Reformation; or a giant enterprise like Gierke's Genossenschaftsrecht that was badly vitiated by the author's conviction that the history of political and legal thought was providentially moving toward its climax in his own theory of the Realperson. In cases of this class the damage is not due to an accumulation of worthless materials; on the contrary, the treatises of this type frequently are still indispensable because of their reliable informations concerning facts (bibliographical references, critical establishment of texts, etc.). The damage is rather done through interpretation. The

content of a source may be reported correctly as far as it goes, and nevertheless the report may create an entirely false picture because essential parts are omitted. And they are omitted because the uncritical principles of interpretation do not permit recognizing them as essential. (Voegelin, 1952: 10)

(19) The following section is adapted from part of a paper written in 1980 for Dr. Michael Morgan at Indiana University. Cf. Berheide, 1980: esp. 9-33.

(20) They thus may serve as those particulars of which Polanyi asks us to be subsidiarily aware, deriving their significance from their relationship to the larger whole.

(21) "Political articulation" is the "process in which human beings form themselves into a society for action" (Voegelin, 1959: 37) The concept is far too complex to discuss thoroughly here.

(22) This is perhaps an unfortunate choice of words in this age of self-help schemes and pseudo-spirituality. The word taken in this context means only that such representation refers to something which is perceived by a society as existing apart from that society, yet within which society might participate, and which serves as the source of meaning for society.

(23) Voegelin notes that evidence for the contention that the order of Truth represented by a particular society can be challenged is seen when we note that in the very act of inquiring as to the possibility of this action "we have set up ourselves as representatives of the truth in whose name we are questioning -- even though its nature and source should be only dimly discerned." (Voegelin, 1959: 59-60)

(24) We see here of course a metaphysical argument for Popper's principle of "methodological individualism".

(25) The translations referred to in the following section are Bloom's Republic (Plato, 1968) and Taylor's

Laws (Plato, 1966).

(26) In the technical sense of Symposium.

(27) The term is Voegelin's (1957a), and emphasizes the participatory nature of existence in metaxy. Man "participates" in both the Divine and the mundane. In this sense, Voegelin also speaks of existence as a "process". (Cf. Voegelin, 1978: passim)

(28) Cf. Diotima's comment in Symposium that

Right opinion ... being incapable of giving a reason, is not knowledge (for how can knowledge be devoid of reason? nor again ignorance, for neither can ignorance attain the truth), but is clearly something which is a mean between ignorance and wisdom. (Plato, 1967: 115)

(29) Voegelin makes an interesting and what I take to be a very important point about the construction in Plato of "pairs of opposites", one of which is the philosopher-philodoxer pair, and of the effect on our understanding of Plato which has occurred through the modern tendency to neglect this principle:

We have philosophers in English, but no philodoxers. The loss in this instance is peculiarly embarrassing, because we have an abundance of philodoxers in reality; and since the Platonic term for their designation is lost, we refer to them as philosophers. (Voegelin, 1957a: 65)

(30) Phaedrus, 278. (Plato, 1920)

(31) The discussion of this aspect of symbolic representation has produced a voluminous literature and has been a primary concern for writers such as Hobbes, Russell, Wittgenstein, Frege, Carnap, and a huge tribe of semanticists and linguistic analysts. We note here that, while our understanding of language and its uses under this ordinary aspect has been enhanced by these

various offerings, benefits are sometimes offset by the failure of many in this pursuit to encourage or even recognize the possibility of increasing our understanding of the second type of symbolic representation.

(32) Hobbes notes that language symbols serve not only as "signs" for inter-personal communication, but also as "marks" for man, reminders of what his thoughts or experiences were in the past. An interesting discussion of Hobbes and language may be found in Danforth, 1980.

VII. A CONCLUDING PRESCIENTIFIC POSTSCRIPT

The eternal essential truth is by no means in itself a paradox; it becomes paradoxical by virtue of its relationship to an existing individual.
--- Soren Kierkegaard

Now faith is the assurance of things hoped for, the conviction of things not seen.

--- Hebrews, 11:1

In this final chapter, let us undertake a brief summary of what has gone before, and then finish with an examination of the practical consequences which our conclusions hold for political science and its relative, history.

Intentions

The intent of this work has been twofold. Its first and primary goal has been to show that the discussion of methodological rules has a place in political science, and that this discussion must proceed on a level "higher" than that of the rules of the various methodologies in question. Methodological controversy is evident in much critical work in political science today, but it is generally confined to taking place within the boundaries of a broad set of shared methodological assumptions, concentrating mainly

on the question of the proper application of those assumptions. Thus, within the behavioral approach to political science, we may find much argument over the propriety of certain statistical techniques, personal assumptions of the scientist, or the identification of variables relevant to an analysis. (1) The parties to such controversies, however, nevertheless retain in common the core assumptions of a broader methodological outlook, and these assumptions are not inconsequential.

(2)

Secondly, we have been concerned with actually performing such an analysis of methodological assumptions, and of showing what is necessary for that analysis to take place. Popper's criticism of the methodological assumptions of logical positivism, inductivism, and historicism, and Polany's and Voegelin's attacks on the axiomatic exclusion of the consideration of values from scientific inquiry were seen to be examples of the level of analysis necessary. But Popper's work in particular, though it reached the necessary level, failed to recognize that level for what it was. His argument became metaphysical in nature, although he protested that it did not. We saw that his failure to acknowledge this fact caused his analysis to be fatally flawed by its ultimate reliance

upon conventionalism. This shows us that deciding upon alternative methodologies demands basing our decision upon critical interpretation of the structure of reality, and this of course is metaphysics.

Arguments

We may briefly recapitulate the entire course of argument by which the dissertation has expressed these concerns.

A first assumption of much contemporary science which was attacked by Popper was that of induction as the general way by which scientific discovery proceeds. This, we saw, could not logically be the case, for the ability to induce requires the ability to formulate some rule for moving from the truth of an indefinite number of singular observation statements to the truth of a universal statement, which is the form of all scientific laws. Such a rule is simply not possible. Popper therefore proposes that we drop the idea that human beings induce altogether, declaring instead that science proceeds by declarations of "bold hypotheses" and attempts to refute them by finding contradicting singular statements.

This step is important, for it shows Popper's

willingness to reject methodological principles on the grounds that they fail to reflect underlying reality. Thus, at this point Popper already begins to treat questions about the structure of reality -- metaphysical questions, really -- as significant. It is clear, however, that he does not recognize what he is doing, for he takes his methodological principle of falsifiability and erects it into a dividing line between science and metaphysics, through his line of demarcation.

We then saw, moreover, that this line fails to delimit the boundaries of science in a satisfactory way, for Popper's argument in support of it is a conventionalist one. According to him, there can be no justification for this principle except that scientists agree to utilize it because it produces successful results. Such justification cannot be forthcoming from the methodology itself, because arguments advanced by Popper and Godel show that methodologies must remain incomplete: all methodologies must generate some true statements which cannot be decided by their own rules, and which instead must be asserted as axioms. Therefore, arguments in favor of a methodology must rely upon its utility: it must be shown to produce desirable results.

The problem is that this success or failure must be measured in terms of problem situations recognized by scientists, and these problems are only problems in the light of certain values which scientists might hold. If these values cannot be rationally analyzed, if statements about them are unfalsifiable, then Popper is left with no means of compelling assent to his principles. Relativism becomes the order of the day.

We then deferred further discussion of this problem to concentrate on the effect which Popper's analysis had on the assumptions of historicism, the doctrine that history can be known by the laws of its movement, and that this is the way to study social phenomena. First we saw Popper's claims that reliance upon historicist methodology (anti-naturalist or pro-naturalist) produced results which were unsatisfactory -- the methodology was "unfruitful".

The anti-naturalist historicist was bound to view social problems and institutions "holistically", and to demand total, "organic" reform in order to achieve viable solutions to problems. But this would in the first place obviate any possibility of testing our hypotheses about institutions, by substituting for the demand that we change our ideas to fit the reality of human nature the demand that we restructure human

nature to fit our ideas. Furthermore, such a program would simply be impossible. It would require two inconceivable things: that we have complete knowledge, a thing contradictory to the restraints of incompleteness, and that we be able to establish total control, a logical impossibility because of the "Oedipus effect".

Pro-naturalistic historicism also fails because it misunderstands the nature of truly scientific laws, and does not notice that historical trends are not laws in the sense of being strictly universal statements, which alone are subject to scientific falsification. The unfruitfulness of this approach then becomes evident in its inability to address anything truly significant about social institutions and problems. The social scientist is left with a few identifiable trends, which may change in the future, and a few trivially true covering laws, from which not much that is truly useful can be derived.

To this point, Popper's criticism was seen to be valid, but it ultimately foundered on precisely the same point as his call for falsification: the historicist could simply reject the "values" and "problems" by which Popper measured the unfruitfulness of historicism, and claim instead that by his own

standards, historicism was successful. (3) Popper's inability to specify the true values of scientific inquiry lets the historicist in the back door.

Once Popper recognized this, he undertook to prove that the historicist's methodological assumptions were actually false, that they did not accurately reflect underlying reality. This reality he claimed was characterized by indeterminism, and a methodology reflecting it must be characterized by incompleteness. Specifically, Popper argued that indeterminism in the physical world was not only an observed feature, but was in addition the logical result of human interaction with that world. That is, events in reality were not only subject to the indeterminism produced by the random, uncaused nature of certain physical events, but were also subject to human interference, and human actions are characterized by the reality of free will. All this he expressed in his "heuristic" notion of "three worlds" of reality, in which the world of physical reality interacts with the world of human ideas in a third, separate world of human artifacts.

This complex, indeterministic nature of reality was then used as his final argument against the possibility of scientific laws of history, or of studying social events according to the demands of such

an assumption. Popper therefore believed that he had shown historicism to be false. Yet we saw that a further problem remained: his unwillingness to recognize his "heuristic" for what it was -- a definite argument from metaphysics -- again required that he turn to convention for acceptance of his ideas. And again, the historicist could evade Popper's criticism by simply denying the legitimacy of his problems and values. (4)

Our conclusion then became evident: no successful criticism of methodology, no matter how powerful, could be accomplished without a willingness to undertake a critical investigation of the structure of reality. We must do metaphysics, and argue about methodological assumptions on the basis of their comportment with reality. This requires that metaphysical statements be just as decidable as their "scientific" counterparts, and Popper's line of demarcation must be abandoned, as was the inductivist and positivist position before him.

We then turned to two examples of thinkers who were willing to engage in the type of metaphysical research necessary for this criticism. Michael Polanyi's investigation led him to conclude that all knowledge, including scientific knowledge, had a tacit component of evaluative commitment. Faith is an

integral and inseparable part of knowing, according to him, and this is a fact about the reality in which all our investigations must take place. Therefore, any methodology which strictly divides "facts" from "values" makes a fundamental mistake about reality, and cannot ultimately produce satisfactory results.

Eric Voegelin asserts much the same thing. After first making the point that defining science as a particular methodology puts the cart before the horse, he argues against the positivistic distinction of facts and values in much the same way as Polanyi. The study of values is just as amenable to rational principles of analysis as is the study of facts. Indeed, the latter cannot proceed without the former. Values may be analyzed, criticized, and argued about, and this is a task appropriate for a science which takes as its object of investigation valuing human beings.

Furthermore, Voegelin makes the case that without such a study, certain serious problems in politics, such as the problem of representation, cannot be adequately comprehended, let alone solved. His own research has convinced him that the problem of representation has at least one dimension which cannot adequately be studied from the perspective of a positivistic denial of metaphysics --- the

"transcendental" aspect of it.

Finally, Voegelin bases his claims about the nature of reality and human ability to know that reality on metaphysical arguments which parallel those of Plato. Voegelin utilizes Plato's understanding of the "In-Between" nature of human existence to explain why the problem of methodology is a problem in the first place. Human beings, "suspended" existentially between the Divine and the Chaotic, know that they cannot know. This feature of reality calls for the consideration of science as a pursuit, rather than a methodology, one which must always remain incomplete, but which can approach or fall away from truth to varying degrees. Knowledge, something static and definite, becomes replaced by knowing, a process.

The dissertation is not meant to make a case for any particular metaphysical interpretation, only to show that such interpretation is necessary. The ideas of Polanyi and Voegelin give the metaphysical backing that would be necessary for Popper's program to be finally successful. (5) Each of his methodological criticisms of positivism and historicism could then be translated into arguments claiming that these methodological assumptions either do not comport with or explicitly deny the true structure of reality. Only

with such an argument can methodological claims be advanced without fear of a debilitating and self-contradictory relativism.

If we note, in finishing this summary, that certain methodological principles exclude the consideration of metaphysical problems from legitimate inquiry, then we see immediately that these methodologies are improperly conceived. Metaphysics is necessary, not optional or just suggested, for without it no methodology can be criticized or justified. Adherence to such a methodology will not aid us, and in fact will often harm us, in our search for the truth about political reality. Without a critical analysis of methodology, even what truth we do manage to learn will ultimately seem to be largely accidental.

General Effects: Science as Symbolism

What effects upon the study of politics may we then expect from a general reintroduction of metaphysics, and in particular of the metaphysics of thinkers such as Polanyi and Voegelin?

To look first at the general effects of reintroducing metaphysics as a serious study in political science, we note the obvious and primary

contribution of an ability to examine scientific methodology at a deeper and more critical level than is generally the case now. Admitting metaphysics means that we understand that methodologies are meant to capture somehow certain essential characteristics of reality, but that they are not to be mistaken for that reality. A methodology, for example, may be understood as symbolizing how we come to have knowledge, but it is itself neither that knowledge nor the process of knowing.

Science, a pursuit utilizing various methodologies, might also then be understood as a symbol. In this sense it is no different from metaphysics, art, religion, or even the "heuristics" of someone like Popper. Symbols are judged according to their ability to express the experience being symbolized. Now Tarski and Popper have both done us a great favor in their attempts to distinguish between words and the objects to which words refer. Popper has advocated replacing "idealism" with "nominalism" -- the idea that words do not themselves refer to essences of reality, but are symbols which we consciously choose to stand for elements of reality. Tarski's correspondence theory of truth draws a similar line between the truth of statements and the facts about reality to which

statements refer. Only a statement may be true or false, not a fact. A fact is simply a fact. (6)

Of course, this distinction seems common-place and not one to be seriously challenged. Who would mistake the word "dog" for a dog, for instance? But it is not that simple, for the question arises as to how we know whether or not a given statement corresponds to the facts of reality. How do we, in simple terms, know that the word "dog" refers to a dog? In the case of linguistic constructs which simply name, we may be satisfied with appealing to convention -- everyone calls it a dog, so we will, too. But conventionalism will not suffice when we begin to investigate the relationships between named objects, when we analyze the logical relationships of statements. For this we need a methodology, which is a linguistic construct and hence, a symbol, and appeals to convention will not be of service.

The focus of metaphysics is our experience of reality, and hence an additional level is introduced here. We may say that Tarski had it only partly correct: while truth and falsity do indeed refer to statements, statements do not directly correspond to facts. Rather, they refer to our experiences of the facts of reality. Reality is not something about which

we can have direct knowledge, as Kant, Popper, Polanyi, and Voegelin have all argued. Instead, we can have knowledge only of that part of reality which is our experience of it. We attempt to communicate this experience by means of symbols, linguistic or otherwise, and to the extent that we are successful at communicating (to ourselves and others) we regard the symbols as being true.

For example, the special relationship of the sides of a perfect right triangle is a fact about reality, even though our actual experience of this relationship is never perfect. This experience is nevertheless what we intend to communicate when we express it in the form of the Pythagorean theorem. The adequacy of our symbol (the theorem) in expressing to our satisfaction this experience is what we mean when we speak of its being "true".

We recognize that the facts of reality are different from our experiences of them when we admit the possibility of mistake and illusion, of incomplete knowledge. We may experience an action as unjust, but may later decide that we were wrong, for instance. But we furthermore distinguish between our experience of justice and the symbols which we may use to express this experience, such as law. We are willing to

assert, to further the example, that sometimes our laws fail to express that experience of justice, and we then call them "false" or "bad" laws. If we mistake law for justice, we may end up slavishly following unjust laws in the name of justice. So, too, if we mistake the rules of a methodology for the pursuit which it symbolizes, we may defeat the purposes of science in the very name of science.

As another example of this type of problem, let us suppose that we accept Popper's zero-order assumption of rationality. (7) as a way of structuring our investigation into social interaction. Now let us further suppose that we do not regard this principle as an inexact expression of our experience of rationality in human beings, but instead treat it as descriptive of reality itself, or as the "truth" about reality. What will we do when we come up against an irrational person, as we surely will do? Treating the principle as reality, we will have to conclude that apparent irrationality is rationality, thus making nonsense of the entire notion. A cautious distinction based upon a metaphysical consideration of the differences between symbol, experience, and fact, would on the other hand entitle us to modify our principle to admit of some exceptions. (8) We can only change our principles to

coincide with reality if we admit that reality exists independently of those principles, which is the underlying proposition of metaphysics. (9)

The reader will have course noted that my above argument about symbol, experience, and fact is a very simplistic and naive metaphysics, and will have undoubtedly discovered serious flaws in it. Everything may in fact be completely different from my description -- but that is just the point. The reader will be able to make such judgements only to the extent that he engages in metaphysics, and he will do this because he implicitly regards the reality of his experience as a standard by which to measure my statements.

Particular Effects: Methodology in Political Science

Let us now examine some particular consequences for the study of political science which we might expect upon committing ourselves to the metaphysical principles of someone like Polanyi or Voegelin. We claim that these principles provide the backing necessary for Popper to criticize the methodological assumptions of positivists and historicists, so we may begin by looking at some effects of denying these assumptions.

The pro-naturalist historicist, for instance, assumes that the study of human behavior and human institutions can proceed in precisely the same way as the study of material behavior and structures. But this assumption overlooks two key characteristics of reality which distinguish the two fields, and which have identifiable consequences for a research program.

First, there is the problem that human researchers studying society are in the position of studying something of which they are a part. Now Popper's discussion of indeterminism in the physical sciences clearly indicates that the inability of the researcher to remove himself completely from the system being studied is an unavoidable problem in both the natural and the social sciences. But while the social scientist has the same problem with researcher-subject interference that the natural scientist does, he must in addition put up with another problem: he is studying something that is fundamentally like himself.

This similarity of subject and researcher both constrains and expands the range of methodologies available to the social scientist. It constrains him by requiring him to impute to his subject characteristics which are not necessarily quantifiable, which he may experience in himself. The very idea, for

example, that social scientists must strive to disencumber their observations and methodology from their own personal biases and values is proof that such biases and values are strong causal factors in human behavior, having a reality which cannot be denied. If these values are not analyzable quantitatively, yet are significant, the researcher must sometimes abandon the manipulation of statistics and turn to other methods of investigation. This does not mean an abandonment of science, unless one simply defines science as a method. If such is the case, however, as it seems to be for many, values become rationally unanalyzable, and hence much of what goes on in social interaction simply cannot be studied scientifically. Thus, a pro-naturalist may in fact find himself quite logically an anti-naturalist, if we understand these terms as Popper has formulated them.

A further constraint place upon methodology by this unique relationship is that of the "Oedipus effect" identified by Popper. This is not a problem for the natural scientist. A prediction which he may make about the behavior of a physical system would not have an effect upon that system, except in certain trivial and uninteresting cases. (10) The social scientist, however, must constantly battle this

problem. Any significant prediction he might make can influence the system he is studying, and therefore actually cause or prevent the predicted event. This is so simply because the objects of his investigation, human beings, are just as capable of learning and of acting upon acquired knowledge as he is. As Popper notes, this constrains methodologies in two ways: it makes it difficult to test methodologies by the success and failure of their predictions, and it introduces serious ethical questions into the art of predicting itself.

But this peculiar subject-researcher relationship also expands the range of useful approaches. For example, if the object of study is human motivation and behavior, and the researcher is a human being, it may be possible to develop an approach in which the researcher studies himself to arrive at conclusions about human nature. This seems to me to have been the method of Socrates: "Know thyself" was not just good advice, but a potentially useful methodological principle. It seems to me that Socrates' reasoning must have gone something like this: "The essence of human nature must consist of what is present and unchanging in all human beings across individuals and time. I am a human being, therefore I have this

nature. I must then attempt to discover what is constant and eternal in my own self, and this will be the essence of human nature." (11) This method of discovery by introspection is one of Strauss' "prescientific" methods. To those who object that it is mere philosophy, we might respond, "So be it!" If it works, if it aids us in our pursuit of truth about human affairs, then it is a good methodology.

Furthermore, the distinctly human nature of the object of inquiry can enable the researcher to put himself in the place of the subject, in a manner of speaking, perhaps using Popper's "rationality principle" or his "logic of the situation". What physicist would not wish to be able to "think like an atom", to know intimately and immediately the experiences and causes which "motivate" atomic behavior? The social scientist is in a position to do something like this, for he can indeed think like a human being in a social setting. He can utilize literature, art, music, history, religion --- all forms of expression of human experience --- and by close attention to the effects which these works produce on him, attempt to understand the experiences symbolized by their authors.

The second special characteristic of social

science which distinguishes it from natural science is that the objects of study must be regarded as having free will. I think the arguments in this dissertation show that there can be no gainsaying this proposition. For all arguments constructed against free will must implicitly contain a premise which asserts free will --- that of the arguer --- and thus declarations of determinism are inherently self-contradictory.

The notion of free will is closely related to the first distinction, as it is free will that accounts for learning and the Oedipus effect, as Popper has shown. But it is yet distinct, for it produces another difficulty which the natural scientist does not have to face: the object of investigation has the ability to deceive the investigator (as well as, perhaps, himself). In natural science, of course, we may speak of being "deceived" by our objects of study, but we know that we haven't been, really. The problem is one of misspecification, mismeasurement, or misinterpretation, all problems with ourselves, not our stars and gasses. Human beings, however, are free to just plain lie. (12) Again, this both constrains and expands the range of useful methodologies. It limits the utility of surveys, for example, as in those well-known cases of surveys finding more people claiming to vote than

actually voted. No amount of statistical tinkering can overcome this problem. But on the other hand, it gives a certain utility to the studies of psychology --- "why and under what circumstances do people lie?" --- and history --- "how often has he lied in the past?".

Indeed, the study of history assumes an importance which it cannot have for the strict behavioralist or historicist. The historicist's assumption (not conclusion) that history may be understood, may be known by learning the laws of its movement, forces upon all his studies an unacceptable deterministic component. His history, and thus his society, seems to leave no room for significant actions, freely-willed by human beings. But if free will is understood as an unavoidable assumption in any social science, then the study of history will be treated as a record of these willed actions and of the consequences which they had in the past. We will not, of course, be able to assert that similar actions will necessarily produce similar effects in the future, for free will obviates the possibility of establishing universal laws of this type. But we will be able to use history to expand our base of investigation into the problems which dominate contemporary social science.

For example, let us look at Marx's claim that

human ideas are determined by the economic context in which these ideas occur. We may find many historical examples of this, and Marxists have often performed a great service in doing so. But we cannot use this deterministic approach to explain how Marx or anyone else could come by the idea of economic determinism in the first place, for this is an idea which supposedly cuts across different economic contexts. That is, we cannot explain how we know that all thought is bound by economic context when this very universal law must itself be so bound. There are certain questions, then, which simply cannot be studied from within the confines of an historicist perspective.

If we free our studies from such a perspective, however, we may engage in a study of history which may throw some light on the problem. If we cannot explain the occurrence of Marx with Marxism, perhaps we can identify other intellectual movements in history which are significantly similar to Marxism. The recognition of these similarities would then provide us with a core set of characteristics which we could examine and attempt to explain. This is what Voegelin has tried to do in his own work on "Order and History". (13)

Freeing our analysis from the demands of historicism also permits us to make another important

assumption: that human beings have a common nature, that some significant characteristic is common to all human beings, across time and varying cultures. The historicist who holds that the essence of human character is determined by the influences of the particular historical "epoch" in which the human exists, cannot make this claim. Therefore, his field of investigation into social problems is radically more restricted than is ours. First of all, he cannot use examples of behavior from other "epochs" to inform his understanding of his own, and secondly, he cannot apply any understanding of his context to any other.

Suppose, for example, that we maintain that, owing to the advent of various economic factors which are evident in our current "capitalistic" era, our ideas and our actions based on them are fundamentally different from those beings of another era. (14) It would then not be possible to investigate modern problems of democracy by turning to examples of similar problems found, say, in the Athens of Socrates. Such an approach would turn out to be as theoretically defensible as studying the social behavior of dinosaurs. But if, on the other hand, we admit constant human nature which spans these so-called "epochs", then we can study history to gain information

which might aid us in solving current problems.

Indeed, such an approach makes possible the solution of problems in the first place. A strict historicist determinism may or may not be able to explain how our problems have arisen, but it cannot in any case permit us to attempt to solve them. We are at the mercy of the laws of history, and if our problems eventually disappear, it is only because of the magical and mysterious designs of history.

The expansion of the field of investigation provided by historical understanding can aid the behavioral approach to political science as well. In the first place, it permits the study of data about political behavior which cannot be collected by methods designed to investigate contemporary behavior. Such study is important for the behavioralist in that it permits him to test hypotheses about current practices against behavior in the past, thereby enabling him to generate hypotheses of a more substantial and far-reaching nature.

This advantage, however, comes at the price of a willingness to undertake the study of the relevancy of both data and hypotheses, which in turn means that the behavioralist cannot remain strictly bound to his positivistic heritage. He must acknowledge both the

desirability and the possibility of a rational consideration of values.

Moreover, the behavioralist who acquires an historical perspective in his studies can avoid the problem of mistaking the momentary characteristics of politics for its essence. Dahl's (1962) analysis of the ruler-ruled relationships in an American city centered primarily upon a behavioralist description of those relationships at the time of the study. But he also used historical analysis to trace the changing aspects of this relationship as supporting evidence for his hypothesis of circulating elites. In a similar way, Agger, Goldrich, and Swanson (1964) combined a cross-sectional analysis of communities with an historical treatment of the stages of development in power relationships. Such types of study enable the social scientist to view his subject both as an institution and as a process, both undeniably important features of any social setting. As Eulau notes, such studies demonstrate that a high degree of historical depth can be beneficial to behavioral studies of politics, without causing them to become history or to lose their emphasis on the individual: "there is no necessary conflict between behavioral and historical methods." (Eulau, 1969a: 7)

Again, however, we must remind ourselves that the utility of historical studies requires that we recognize it. Without an evaluative framework from within which we can identify problems for study, the use of history is bound to degenerate into an uncritical collection of "facts". The historian must select his object of study and his data in really the same way that the statistical researcher selects his variables: on the basis of their relevance to the problem being studied. We have seen that this relevance can only be understood in relation to critically-held values of the researcher. Again, a willingness to consider values becomes paramount.

Incompleteness and Learning

Finally, let us address a question of recurring importance which may have occurred to the reader. What effect does a methodology predicated on incompleteness and indeterminism have upon our ability to learn, both individually and socially? Furthermore, does not all that has been demonstrated here simply reduce to the assertion that human beings can never have perfect and complete knowledge and that consequently we must maintain a vigilant and critical approach to whatever

"knowledge" we may claim? And is not this assertion rather uncontroversial in this day and age and not seriously doubted by contemporary social science? Why, then, does it seem so important to restate in such a complicated fashion what must be patently obvious?

To take the latter problem first, perhaps it is patently obvious to people of good sense that human beings are not gods, and that they cannot aspire to complete, perfect knowledge. "Intellectual obsolescence is always around the corner," admits Eulau, and no methodology is immune to it. (Eulau, 1969a: 9) Why should it be necessary to restate this, and even to attempt to prove it?

Without indulging in a psychological examination of the willingness of human beings to aspire to be gods, we may state that it is necessary for the simple reason that methodologies and their effects outlive their creators. If a methodological principle implicitly assumes the possibility of complete knowledge, or this assumption can be logically derived from its other assumptions, such an attitude becomes incorporated into the research program of even those sensible people who would reject it were they aware of it. We regard methodologies as useful precisely because they assume things that we do not wish to

investigate every time we undertake research. Just as law is useful so that we do not have to trouble ourselves with the justice of every action, the principle of methodological individualism is useful so that we do not have to wonder about where consciousness resides in reality whenever we research interest group activity.

We do have to worry about these things sometimes, though, in order to ensure that we do not need to worry the rest of the time. We must be willing to investigate justice, so we can create laws which will induce us to act justly without really thinking about it, and we need to examine methodologies to make certain that they assume only what we want them to. If a law is unjust, we change it, without thereby redefining jurisprudence. If a methodology makes an inappropriate assumption, we should change it too, without thinking we have abandoned or destroyed science.

Is it possible to learn in such an atmosphere? It is --- and only in such an atmosphere. For as Popper has shown, only incompleteness can account for the possibility of the growth of knowledge. Without it, we must either be perfectly knowledgeable or perfectly ignorant, and in either case no growth can occur. We

grow in our knowledge through the testing of our hypotheses, which is only possible when all hypotheses are permitted to be regarded as potentially false (including methodological assumptions). We should not be dismayed that this eternal possibility of being wrong indicates that we can never regard ourselves as being in possession of the truth. Just because we cannot know perfectly does not mean that we cannot know imperfectly, and that we should just give up the search for knowledge. We must instead distinguish between perfect, divine, knowledge and human knowledge, and understand that human knowledge is better than nothing. A little knowledge may indeed be a dangerous thing, but not nearly as dangerous as a hopeless disavowal of knowledge altogether, or as the hybris which demands that we be more than we are.

(1) Allan Carlson (1982), for example, argues against Ross and Sawhill's (1975) conclusion that a father's absence from a family does not in itself affect children adversely, by pointing out that the researchers' operationalizations and choice of variables for study effectively assumes what they have set out to prove. He does not, however, question the utility of statistical methodology in studying this problem.

(2) Some controversy over methodological assumptions is always evident, though. Philip Gregg's (1974) analysis of Wilson, Weber, and organization theory is an example of a criticism directed towards methodological assumptions. Specifically, he addresses the "unit of analysis" problem outlined in chapter one of this work, deciding that the institutional level of analysis in these cases causes researchers to overlook significant causal factors in public policy output. Ostrom (1974) is another example of the assertion that a systemic approach may assume away important elements of a successful analysis of institutions of a federal nature.

(3) "The ends justify the means", as it were. Again, we recall the arguments of those who would change their methodologies if they failed to produce the "proper" conclusions, such as my Marxist friend who advocated freeing his analysis from the demands of logic when it suited his purposes.

Note that selecting a methodology according to the conclusions we wish to produce is not the same thing as selecting it according to the demands of the object under investigation. The former is illegitimate, for it denies the special independence of reality, while the latter is both legitimate and necessary.

(4) By dismissing them as mere "bourgeois abstractions", for example.

(5) Other metaphysical arguments might also back Popper's analysis. The point is that some such argument is necessary.

(6) Remember the connection between this distinction and Popper's objective knowledge. We can only criticize the knowledge we have which we put into linguistic form, for only this form may be predicated

by truth and falsity.

(7) See the discussion of this in chapter four. To recall, this principle refers to the assumption of "complete rationality" on the part of the human subjects of our study.

(8) Indeed, this would allow us to apply the principle as Popper suggests: to use it as a standard by which to measure the actual behavior of our subjects.

(9) Note that this willingness to modify methodology according to reality precisely reflects Popper's demand that our methodology promote a willingness to modify our hypotheses to reflect reality (or, rather, our experiences of it). Thus the scientific principle is applied to science itself, making it a "metascientific", or metaphysical, principle.

(10) A physicist may, for example, predict that the air currents in his laboratory will shift slightly, and his speaking aloud that prediction will cause the event predicted to occur.

Heisenberg uncertainty is not trivial or uninteresting, but it is not the same thing, for here change in the system occurs as a result of measurement interference, not of prediction.

(11) He might also add: "Naturally, I do not trust myself completely --- for I am old, and easily fooled --- therefore I will take this essence and see if I find it also in other human beings, as a test." And thus, the methodological principle of intersubjective validation is born.

(12) The possibility of deceit is an integral part of politics. Bargaining, propaganda, political mythology, and general political strategies and tactics all make use of deliberate deception. For a discussion of the extent to which this hampers a strictly behavioral approach to political science, see Berheide (1976).

(13) Voegelin (1956, 1957, 1957a, 1975). See also Voegelin (1975a, 1968) for the analysis of Marxism in this respect.

(14) I call them "beings" rather than "human beings" to emphasize the lack of common essential characteristics.

- Ackermann, Robert John. (1976) The Philosophy of Karl Popper. Amherst: University of Massachusetts Press.
- Addis, Laird. (1966) "The Individual and the Marxist Philosophy of History". Philosophy of Science, 33, 101-117. Reprinted in Brodbeck (1968: 317-335).
- Adkins, A.W.H. (1961) "Review: The World of the Polis and Plato and Aristotle". Journal of Hellenic Studies, 81, 192-193.
- Agassi, Joseph. (1963) "The Novelty of Popper's Philosophy of Science". International Philosophical Quarterly, 8, 412-463.
- Agger, Robert E., Daniel Goldrich, and Bert E. Swanson. (1964) Rulers and the Ruled: Political Power and Impotence in American Communities. New York: John Wiley.
- Almond, Gabriel. (1946) "Politics, Science, and Ethics". American Political Science Review, 40, 283-293.
- Albright, W.F. (1961) "Review: Israel and Revelation". Theological Studies, 22, 270-279.
- Altizer, T.J.J. (1975) "A New History and a New but Ancient God?". Journal of the American Academy of Religion, 43, 757-764. See Voegelin (1975b) for a response.
- Anderson, Bernhard, ed. (1969) The Old Testament and Christian Faith. New York: Herder and Herder.
- Anderson, Bernhard. (1971) "Politics and the Transcendent". Political Science Reviewer, 1, 1-29. Reprinted and expanded in McKnight, ed. (1977: 62-100).
- Anderson, William. (1953) "Review: The New Science of Politics". Journal of Politics, 15, 563-568.
- Arendt, Hannah. (1953) "A Reply". Review of Politics,

- 15, 76-85. A reply to Voegelin (1953).
- Aron, Raymond, ed. (1963) World Technology and Human Destiny. Ann Arbor: University of Michigan Press.
- Arrow, Kenneth. (1968) "Mathematical Models in the Social Sciences". In Brodbeck, ed. (1968: 635-667).
- Atkins, Anselm. (1966) "Eric Voegelin and the Decline of Tragedy". Drama Survey, 5, 280-285.
- Augustine. (1972) The City of God. David Knowles, ed. Henry Bettenson, trans. Middlesex, England: Penguin Books.
- Ayer, A.J. (1959) "On Scientific Method". Spectator, 202 (January 30), 163.
- Ayer, A.J. (1963) "Review of Conjectures and Refutations". New Statesman, 65 (February), 155.
- Bailyn, Bernard. (1967) The Ideological Origins of the American Revolution. Cambridge, Mass.: Harvard University Press.
- Baker, Robert S. (1982) The Dark Historic Page. Madison: University of Wisconsin Press.
- Ball, W.W. Rouse. (1908) A Short Account of the History of Mathematics. New York: Dover. Reprinted in 1960.
- Bay, Christian. (1969) "Politics and Pseudopolitics: A Critical Evaluation of Some Behavioral Literature". In Eulau, ed. (1969: 109-140).
- Beard, Charles. (1935) An Economic Interpretation of the Constitution of the United States. New York: Free Press.
- Becker, Carl. (1932) The Heavenly City of the Eighteenth-Century Philosophers. New Haven: Yale University Press. 1974 printing.
- Bergmann, Gustav. (1955) "Outline of an Empiricist Philosophy of Physics". In Feigl and Brodbeck, eds. (1955: 262-287).

- Bergmann, Gustav. (1967) The Metaphysics of Positivism. Westport, Conn.: Greenwood Press.
- Berheide, Michael. (1976) "Behavioralism, Probability, and the Concept of Lies". Unpublished paper.
- Berheide, Michael. (1980) "The Greek Spiritual Personality". Unpublished paper.
- Berheide, Michael. (1981) "Proofs of Popper's Theory of Frequency in Finite Classes." Unpublished paper.
- Berheide, Michael. (1982) "Augustine as a Political Scientist". Religious and Historical Perspectives lecture presented at Berea College. November, 1982.
- Berlin, Isaiah. (1954) Historical Inevitability. London: Oxford University Press.
- Bernstein, Richard J. (1976) The Restructuring of Social and Political Theory. University of Pennsylvania Press.
- Berry, T. (1958) "Review: Order and History (I-III)". Thought, 33, 273-278.
- Beveridge, W.I.B. (1957) The Art of Scientific Investigation. New York: Random House. Revised Edition.
- Bloom, Alan. (1960) "Review: Wissenschaft, Politik, und Gnosis". American Political Science Review, 54, 226-227.
- Buchanan, James, and Gordon Tullock. (1962) The Calculus of Consent: Logical Foundations of Constitutional Democracy. Ann Arbor: University of Michigan Press.
- Bouveresse, Renee. (1978) Karl Popper. Paris: J. Vrin.
- Bunge, Mario Auguste, ed. (1964) The Critical Approach to Science and Philosophy. New York: Free Press of Glencoe.
- Bishop, P. (1980) "Popper's Principle of

- Falsifiability and the Irrefutability of the Davesian Cycle". Professional Geographer, 32, (August), 310-315.
- Braithwaite, R.B. (1953) Scientific Explanation. Cambridge: Cambridge University Press.
- Brecht, Arnold. (1953) "Review: The New Science of Politics". Annals of the American Academy of Political and Social Sciences, 307, 215-216.
- Brecht, Arnold. (1953a) "A New Science of Politics". Social Research, 20, 230-235.
- Brodbeck, May. (1962) "Explanation, Prediction, and Imperfect Knowledge". Minnesota Studies in the Philosophy of Science, III. Herbert Feigl and Grover Maxwell, ed. Minneapolis: University of Minnesota Press. Reprinted in Brodbeck, ed. (1968: 363-398).
- Brodbeck, May, ed. (1968) Readings in the Philosophy of the Social Sciences. New York: MacMillan.
- Brodbeck, May. (1968a) "Methodological Individualisms: Definition and Reduction". In Brodbeck, ed. (1968: 280-303).
- Brown, Stanley B., ed. (1972) The Realm of Science. 21 vols. Louisville: Touchstone.
- Brown, T.S. (1958) "Review: Order and History". Annals of the American Academy of Political and Social Sciences, 314, 187-188.
- Brownhill, R.J. (1968) "Michael Polanyi and the Problem of Personal Knowledge". Journal of Religion, 48, 115-123.
- Buchanan, James. (1967) "Politics and Science: Reflections on Knight's Critique of Polanyi". Ethics, 77, 303-310.
- Byerly, Henry C. (1973) A Primer of Logic. New York: Harper and Row.
- Caldwell, Bruce. (1982) Beyond Positivism: Economic Methodology in the Twentieth Century. Boston: Allen and Unwin.

- Carlson, Allan C. (1982) "Sex According to Social Science". Policy Review, 20 (Spring), 115-138.
- Carnap, Rudolph. (1962) Logical Foundations of Probability. Chicago: University of Chicago Press. Second edition.
- Charlesworth, James C. (1962) Behavioralism in Political Science. Philadelphia: American Academy of Political and Social Science.
- Churchill, Winston. (1947) My Early Life: A Roving Commission. London: Odhams Press.
- Chroust, A.H. (1958) "Review: The World of the Polis". The Thomist, 21, 381-391.
- Cicero. (1942) De Fato. H. Rackham, trans. Cambridge, Mass.: Harvard University Press (Loeb Classical Library).
- Cole, Leonard. (1983) Politics and the Restraint of Science. Totawa, N.J.: Rowman and Allanheld.
- Comte, Auguste. (1957) A General View of Positivism. New York: Robert Speller and Sons.
- Cooper, Barry. (1977) "A Fragment From Eric Voegelin's History of Western Political Thought". Political Science Reviewer, 7, 23-52.
- Cornforth, Maurice. (1968) The Open Philosophy and the Open Society: A Reply to Dr. Karl Popper's Refutations of Marxism. New York: International Publishers.
- Corrington, John William, ed. (1975) "A Symposium on Eric Voegelin". Denver Quarterly, 10, No. 3, 93-138.
- Corrington, John William. (1975a) "Order and History: The Breaking of the Program". In Corrington, ed. (1975: 115-122).
- Corrington, John William. (1978) "Order and Consciousness/Consciousness and History: The New Program of Eric Voegelin". In McKnight, ed. (1978: 155-195).

- Dahl, Robert A. (1955) "The Science of Politics: Old and New". World Politics, 7, 479-489.
- Dahl, Robert A. (1962) Who Governs? Democracy and Power in an American City. New Haven: Yale University Press.
- Dahl, Robert A. (1969) "The Behavioral Approach in Political Science: Epitaph for a Monument to a Successful Protest". In Eulau, ed. (1969: 68-92).
- Davidson, Donald. (1968) "Actions, Reasons, and Causes". In Brodbeck, ed. (1968: 44-58).
- De Vries, Gerrit Jacob. (1952) Antisthenes Redivivus: Popper's Attack on Plato. Amsterdam: North-Holland.
- Donagan, Alan. (1966) "The Popper-Hempel Theory Reconsidered". In Dray, ed. (1966: 146-150).
- Douglass, Bruce. (1976) "The Gospel and Political Order: Eric Voegelin on the Political Role of Christianity". Journal of Politics, 38, 25-45.
- Douglass, Bruce. (1977) "The Break in Voegelin's Program". Political Science Reviewer, 7, 1-21.
- Douglass, Bruce. (1978) "A Diminished Gospel: A Critique of Voegelin's Interpretation of Christianity". In McKnight, ed. (1978: 139-154)
- Dray, William. (1957) Laws and Explanations in History. Oxford: Oxford University Press.
- Dray, William. (1963) "The Historical Explanation of Actions Reconsidered". In Hook, ed. (1963: 105-135).
- Dray, William, ed. (1966) Philosophical Analysis and History. New York.
- East, John P. (1978) "Eric Voegelin and American Conservative Thought". Modern Age, 22, No. 2, 114-132.
- Eccles, John. (1970) Facing Reality. Berlin: Springer-Verlag.

- Eddington, Sir Arthur. (1959) New Pathways in Science. London: Cambridge University Press. Partially reprinted as "The Theory of Groups" in Brown, ed. (1972, III: 155-167).
- Eulau, Heinz, ed. (1969) Behavioralism in Political Science. New York: Atherton Press.
- Eulau, Heinz. (1969a) "Tradition and Innovation: On the Tension Between Ancient and Modern Ways in the Study of Politics". In Eulau, ed. (1969: 1-21).
- Feigl, Herbert and May Brodbeck, eds. (1955) Readings in the Philosophy of Science. New York: Appleton-Century-Crofts, Inc.
- Feinberg, Joel. (1973) Social Philosophy. Englewood Cliffs, N.J.: Prentice-Hall.
- Ferguson, A.T., ed. (1976) Revolution or Reform? A Confrontation Between Karl Popper and Herbert Marcuse. Michael Alward and A.T. Ferguson, trans. Chicago: New University Press.
- Feyerabend, Paul K. and Grover Maxwell, eds. (1966) Mind, Matter, and Method: Essays in Philosophy and Science in Honor of Herbert Feigl. Minneapolis: University of Minnesota Press.
- Fisher, E.J. (1957) "Review: Israel and Revelation". Annals of the American Academy of Political and Social Sciences, 310, 233.
- Fitzsimmons, M.A., T. McAvory, and Frank O'Malley, eds. (1959) The Image of Man. Notre Dame: University of Notre Dame Press.
- Franklin, J.A. (1953) "Review: The New Science of Politics". Political Science Quarterly, 68, 157-158.
- Freeman, Michael. (1975) "Sociology and Utopia: Some Reflections on the Social Philosophy of Karl Popper". British Journal of Sociology, 26, (March), 20-34.
- Friedman, Milton. (1953) Essays in Positive Economics. Chicago: University of Chicago Press. Partially reprinted as "The Methodology of Positive

- Economics" in Brodbeck, ed. (1968: 508-528).
- Gardiner, Patrick, ed. (1959) Theories of History. Glencoe, Ill.: Free Press.
- Gargan, Edward T., ed. (1961) The Intent of Toynbee's History. Chicago: Loyola University Press.
- Gehman, H.S. (1958) "A Theology of History". Interpretation, 12, 318-321.
- Gellner, Ernest. (1956) "Explanations in History". Proceedings of the Aristotelian Society, Suppl. vol. 30, 157-176. Reprinted as "Holism versus Individualism" in Brodbeck, ed. (1968: 254-268).
- Gelwick, R.L. (1965) "Michael Polanyi: Modern Reformer". Religion in Life, 34, 224-234.
- Germino, Dante. (1964) "Eric Voegelin's Contribution to Contemporary Political Theory". Review of Politics, 26, 378-402.
- Germino, Dante. (1967) Beyond Ideology. New York: Harper and Row.
- Germino, Dante. (1971) "Eric Voegelin's Anamnesis". Southern Review, 7, 68-88.
- Germino, Dante. (1972) "Two Conceptions of Political Philosophy". In Graham and Carey, eds. (1972: 261-284).
- Germino, Dante. (1975) "Eric Voegelin: The In-Between of Human Life". In Minogue and de Crespigny, eds. (1975: 100-119).
- Germino, Dante. (1975a) "Review: The Ecumenic Age". Journal of Politics, 37, 847-848.
- Germino, Dante. (1978) "Karl Popper's Open Society". Political Science Reviewer, 8, 21-62.
- Germino, Dante. (1982) Political Philosophy and the Open Society. Baton Rouge: Louisiana State University Press.
- Gerwith, Alan. (1953) "Review: The New Science of Politics". Ethics, 63, 142-144.

- Godel, Kurt. (1931) "On Formally Undecidable Propositions of Principia Mathematica and Related Systems, I". Reprinted in Heijenoort, ed. (1980: 87-107).
- Graham, George and George Carey, eds. (1972) The Post-Behavioral Era: Perspectives on Political Science. New York: David McKay Co.
- Gray, John N. (1976) "The Liberalism of Karl Popper". Government and Opposition, 11 (Summer), 337-355.
- Green, Philip and Sanford Levinson, eds. (1970) Power and Community: Dissenting Essays in Political Science. New York: Vintage Books.
- Greenberg, Moshe. (1957) "Review: Order and History (I)". American Political Science Review, 51, 1101-1103.
- Greeno, James. (1971) "Explanation and Information". In Salmon, ed. (1971: 89-104).
- Gregg, Philip. (1974) "Units and Levels of Analysis: A Problem of Policy Analysis in Federal Systems". Publius, 4 (Fall).
- Griffith, Ernest S., ed. (1948) Research in Political Science: The Work of the Research Committee, American Political Science Association. Chapel Hill: University of North Carolina Press.
- Gueguen, John A. (1978) "Voegelin's From Enlightenment to Revolution: A Review Article". The Thomist, 42, 123-134.
- Hadas, Moses. (1958) "Review: Order and History (I-III)". Journal of the History of Ideas, 19, 442-444.
- Hallowell, John. (1972) "Existence in Tension: Man in Search of His Humanity". Political Science Reviewer, 2, 162-184. Reprinted in McKnight, ed. (1977: 101-126).
- Hallowell, John. (1982) "Eric Voegelin: The Master Path Finder Revisited". Modern Age, 26, Nos. 3-4, 397-403.

- Hammer, Carl, Jr., ed. (1952) Goethe After Two Centuries. Baton Rouge: Louisiana State University Press.
- Hardin, Garret. (1964) "The Tragedy of the Commons". Reprinted in Garret Hardin, Exploring New Ethics for Survival: The Voyage of the Spaceship Beagle. New York: Viking Press, 1972.
- Harrigan, Anthony. (1953) "Political Gnosticism". Christian Century, 70, 386.
- Harris, Marvin. (1979) Cultural Materialism: The Struggle for a Science of Culture. New York: Random House.
- Havard, William. (1971) "The Changing Pattern of Voegelin's Conception of History and Consciousness". Southern Review, 7, 49-67. Reprinted in McKnight, ed. (1977: 1-25).
- Havard, William. (1975) "Voegelin's Diagnosis of the Western Crisis". In Corrington, ed. (1975: 127-134).
- Havard, William. (1977) "Voegelin's Contribution to Political Theory". Polity, 10, 33-64.
- Hayek, F.A. (1952) The Counter-Revolution of Science. London: Allen and Unwin.
- Hempel, Carl. (1965) Aspects of Scientific Explanation. Free Press.
- Hempel, Carl. (1968) "The Logic of Functional Analysis". In Brodbeck, ed. (1968: 179-210).
- Hempel, Carl and Peter Oppenheim. (1953) "The Logic of Explanation". In Feigl and Brodbeck, eds. (1953).
- Himka, John Paul. (1975) "Limits of Historical Poverty: The Philosophical Basis of Social Science". Science and Society, 39 (Summer), 215-218.
- Hook, Sidney. (1957) "Review: Israel and Revelation". Society for Old Testament Study Booklist, 57ff.

- Hook, Sidney, ed. (1963) Philosophy and History. New York.
- Horn, R.L. (1957) "Review: Israel and Revelation". Union Theological Seminary Quarterly Review, 12, 65-67.
- Hoye, Timothy. (1981) "Voegelin's Political Vocabulary". Paper presented at the annual meeting of the Southern Political Science Association. November 5-7, 1981. Memphis, Tennessee.
- Hume, David. (1896) A Treatise of Human Nature. L.A. Selby-Bigge, ed. Oxford: Clarendon Press.
- Hummel, H. (1958) "Review: Israel and Revelation". Concordia Theological Monthly, 29, 53-54.
- Hunold, Albert, ed. (1961) Freedom and Serfdom. Dordrecht - Holland: D. Reidel.
- Innis, Robert. (1973) "The Logic of Consciousness and the Mind-Body Problem in Polanyi". International Philosophical Quarterly, 13, 81-98.
- Jaki, Stanley. (1978) The Origin of Science and the Science of its Origins. Chicago: Henry Regnery.
- James, E.O. (1957) "Review: Israel and Revelation". Hibbert Journal, 55, 408-410.
- James, William. (1976) Essays in Radical Empiricism. Cambridge, Mass: Harvard University Press.
- Jarvie, Ian C. (1969) The Revolution in Anthropology. Chicago: Henry Regnery.
- Jarvie, Ian C. (1972) Concepts and Society. London and Boston: Routledge and Kegan Paul.
- Jasper, Karl. (1949) The Perennial Scope of Philosophy. Ralph Mannheim, trans. New York: Philosophical Library.
- Jeffrey, Richard. (1971) "Statistical Explanation versus Statistical Inference". In Salmon, ed. (1971: 19-28).

- Johansson, Ingvar. (1975) A Critique of Karl Popper's Methodology. Goteberg: Esselte Studium Akademie.
- Kahane, Howard. (1980) Logic and Contemporary Rhetoric: The Use of Reason in Everyday Life. Third edition. Belmont, Cal.: Wadsworth.
- Kassner, Edward and James Newman. (1940) Mathematics and the Imagination. New York: Simon and Shuster. Reprinted in part as "The Problem of Infinity" in Brown (1972, III: 28-40).
- Kaufmann, Walter, ed. (1968) The Portable Nietzsche. Middlesex, England: Penguin Books.
- Kemeny, J.G. (1958) "Two Autonomous Axiom Systems for the Calculus of Probability". Journal of Symbolic Logic, 23 (Spring), 349.
- Kerferd, G.B. (1959) "Review: The World of the Polis and Plato and Aristotle". Classical Review, 9, 251-252.
- Kirk, Russell. (1957) "Behind the Veil of History". Yale Review, 46, 466-476.
- Kneale, William. (1955) "Induction, Explanation, and Transcendent Hypotheses". In Feigl and Brodbeck, eds. (1955: 353-367).
- Knight, Frank. (1949) "Virtue and Knowledge: The View of Professor Polanyi". Ethics, 59, 271-284.
- Kohn, Hans. (1953) "Politics and Ethics". Nation, 176, 57.
- Kuhn, Thomas. (1970) The Structure of Scientific Revolutions. Second edition. Chicago: University of Chicago Press.
- Krieger, Leonard. (1977) Ranke: The Meaning of History. Chicago: University of Chicago Press.
- Kuntz, Paul, ed. (1968) The Concept of Order. Seattle: University of Washington Press.
- Kweit, Mary G. and Robert Kweit. (1981) Concepts and Methods for Political Analysis. Englewood Cliffs, N.J.: Prentice-Hall.

- Lakatos, Imre and Alan Musgrave, eds. (1970) Criticism and the Growth of Knowledge. Cambridge: University Press.
- Lakatos, Imre. (1974) "Popper on Demarcation and Induction". In Schlipp, ed. (1974: 241-273).
- Langford, Thomas. (1966) "Michael Polanyi and the Task of Theology". Journal of Religion, 46, 45-55.
- Lauden, Larry. (1977) Progress and Its Problems: Towards a Theory of Scientific Growth. Berkeley: University of California Press.
- Lessnoff, Michael. (1980) "The Political Philosophy of Karl Popper". British Journal of Political Science, 10 (January), 99-120.
- Levy, David. (1978) "Karl Popper: His Philosophy of Politics". Modern Age, 22, No. 2, 151-160.
- Levy, David. (1980) "Voegelin as Philosopher". Modern Age, 24, No. 1, 47-54.
- Lichtman, R. (1965) "Karl Popper's Defense of the Autonomy of Sociology". Social Research, 32 (Spring), 1-25.
- Lipset, Seymour Martin. (1981) Political Man: The Social Bases of Politics. Baltimore: Johns Hopkins.
- Lowith, Karl. (1949) Meaning in History. Chicago: University of Chicago Press.
- MacGuire, N.R.P. (1963) "Review: Order and History (I-III)". Catholic Historical Review, 38, 410-412.
- Magee, Brian. (1971) Modern British Philosophy. New York: St. Martin's Press.
- Magee, Brian. (1973) Karl Popper. New York: Viking Press.
- Manheim, Jarol and Richard Rich. (1981) Empirical Political Analysis. Englewood Cliffs, N.J.: Prentice-Hall.

- Mannheim, Karl. (1941) Man and Society in an Age of Reconstruction. New York: Harcourt, Brace and Company.
- Marcuse, Herbert. (1959) "Notes on the Problem of Historical Laws". Partisan Review, 26 (Winter), 117-129.
- Marks, J.H. (1958) "Review: Israel and Revelation". Theology Today, 15, 266-269.
- Marx, Karl. (1967) Capital. Three volumes. Frederick Engels, ed. New York: International Publishers.
- Marx, Karl. (1978) "Theses on Feuerbach". In Tucker, ed. (1978: 143-145).
- Marx, Karl. (1978a) "Economic and Philosophical Manuscripts of 1844". In Tucker, ed. (1978: 66-125).
- Marx, Karl and Friedrich Engels. (1978) "Manifesto of the Communist Party". In Tucker, ed. (1978: 473-500).
- Mauchline, J. (1960) "Review: The World of the Polis and Plato and Aristotle". Journal of Semitic Studies, 5, 84-85.
- McDonald, L.C. (1957) "Voegelin and the Positivist: A New Science of Politics?". Midwest Journal of Political Science, 1, 233-251.
- McDonald, Neil A. and James N. Roseman. (1968) "Political Theory as Academic Field and Intellectual Activity". Journal of Politics, 30, 311-344.
- McKnight, Stephan. (1975) "Recent Developments in Voegelin's Philosophy of History". Sociological Analysis, 37, 265-271.
- McKnight, Stephan. (1976) "Voegelin on the Modern Intellectual and Political Crises". Sociological Analysis, 37, 265-271.
- McKnight, Stephan, ed. (1978) Eric Voegelin's Search for Order in History. Baton Rouge: Louisiana State University Press.

- McKnight, Stephan. (1978a). "The Evolution of Voegelin's Theory of Politics and History: 1944-1975". In McKnight, ed. (1978: 26-45).
- McLachan, Hugh V. (1980) "Popper, Marxism, and the Nature of Social Laws". British Journal of Sociology, 31 (March), 66-77.
- Mead, W.B. (1973) "Christian Ambiguity and Social Disorder". Interpretation, 3, 221-242.
- Medvedev, Zhores A. (1969) The Rise and Fall of T. D. Lysenko. I.M. Lerner, trans. New York: Columbia University Press.
- Merriman, W. Richard. (1982) "Salmon's Critique of Hempel: An Alternative View of Statistical Explanation and Theory Building". Presented at the annual meeting of the Southern Political Science Association. October 28-30, 1982. Atlanta, Georgia.
- Michalos, Alex D. (1971) The Popper/Carnap Controversy. The Hague: Nijhoff.
- Mill, John Stuart. (1900) A System of Logic, Ratiocination, and Inductive; Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation. Eighth Edition. New York: Harper and Brothers.
- Miller, D.G., and D. Hadidian, eds. (1971) Jesus and Man's Hope. Pittsburgh: Pittsburgh Theological Seminary.
- Miller, Walter. (1961) A Canticle for Leibowitz. London: Widenfeld and Nicolson.
- Minogue, K.R. and A. de Crespigny, eds. (1975) Contemporary Political Philosophers. New York: Dodd and Mead.
- Molnar, Thomas. (1975) "Voegelin as Historian". Modern Age, 19, 427-429.
- Momigliano, Arnaldo. (1974) Historicism Revisited. Amsterdam: North-Holland.
- Montgomery, Marion. (1978) "Flannery O'Conner, Eric

- Voegelin, and the Question that Lies Between Them". Modern Age, 22, 133-143.
- Moore, A.C. (1958) "Review: Israel and Revelation. Interpretation, 12, 368ff.
- Muller, Herbert J. (1956) "Shuddering Before the Mystery". New Republic, 125, 19-20.
- Muller, Herbert J. (1956a) "The Pride and Prejudice of Toynbee". New Republic, 135 (September 10), 16-19.
- Murry, Michael. (1970) Modern Philosophy of History: Its Orgins and Destination. The Hague: Martinus Nijhoff.
- Nachmias, David and Chava Nachmias. (1981) Research Methods in the Social Sciences. Second edition. New York: St. Martin's Press.
- Nagel, Ernest, and James Newman. (1972) Godel's Proof. New York: New York University Press. Reprinted in part in Brown, ed. (1972, III: 181-185).
- Natanson, Maurice, ed. (1970) Phenomenology and Social Reality. The Hague: Martinus Nijhoff.
- Newton, Isaac. (1934) "Selections from Principia Mathematica". Mathematical Principles of Natural Philosophy and His System of the World, by Sir Isaac Newton. Andrew Motte, trans. University of California Press.
- Niemeyer, Gerhart. (1957) "The Order of History and the History of Order". Review of Politics, 19, 403-409.
- Niemeyer, Gerhart. (1958) "The Depth and Height of Political Order". Review of Politics, 21, 588-596.
- Niemeyer, Gerhart. (1965) "Eric Voegelin's Achievement". Modern Age, 9, 132-140.
- Niemeyer, Gerhart. (1968) "The Order of Consciousness". Review of Politics, 30, 251-256.
- Niemeyer, Gerhart. (1971) Between Nothingness and

- Paradise. Baton Rouge: Louisiana State University Press.
- Niemeyer, Gerhart. (1976) "Eric Voegelin's Philosophy and the Drama of Mankind". Modern Age, 20, 28-39.
- Niemeyer, Gerhart. (1982) "Eric Voegelin, 1952". Modern Age, 26, Nos. 3-4, 262-266.
- Nietzsche, Friedrich. (n.d.) "On Truth and Falsehood in the Extra-Moral Sense". Unknown Translator. Unpublished mimeograph circulated at Indiana University.
- Nietzsche, Friedrich. (1968) "Thus Spoke Zarathustra". In Kaufmann, ed. (1968: 103-439).
- Oates, W.J. (1960) "Review: Plato and Aristotle". Classical Journal, 56, 90-92.
- Olson, Mancur. (1971) The Logic of Collective Action: Public Goods and the Theory of Groups. Cambridge: Harvard University Press.
- Ostrom, Vincent. (n.d.) "Order and Change Amid Increasing Relative Ignorance: An Inquiry into the Relationship of Knowledge, Decision-Making, and Organization". Unpublished paper. Indiana University.
- Ostrom, Vincent. (1972) "Can Federalism Make a Difference?". Paper presented at TOWARDS '76: A Conference on Developing an Agenda for Revitalizing the American Federal System. April 23-25, 1972. Philadelphia, Pennsylvania.
- Ostrom, Vincent. (1972a) "Polycentricity". Paper presented at the 1972 Annual Meeting of the American Political Science Association. September 5-9, 1972. Washington, D.C.
- Ostrom, Vincent. (1974) The Intellectual Crisis in American Public Administration. University, Alabama: University of Alabama Press.
- Ostrom, Vincent. (1974a) "Language, Theory, and Empirical Research: Elements of a Paradigm Reformation in Public Administration". Paper presented at the Annual Meeting of the American

- Political Science Association. August 30, 1974. Chicago, Illinois.
- Peters, F.E. (1967) Greek Philosophical Terms: A Historical Lexicon. New York: New York University Press.
- Petras, J. (1966) "Popperism: The Scarcity of Reason". Science and Society, 30 (Winter), 1-10.
- Pike, Kenneth. (1967) Language in Relation to a Unified Theory of the Structure of Human Behavior. Second edition. The Hague: Mouton.
- Plato. (1920) The Dialogues of Plato. Benjamin Jowett, trans. New York: Random House.
- Plato. (1966) Laws. A.E. Taylor, trans. Everyman's Library.
- Plato. (1967) Euthyphro, Crito, Apology, and Symposium. Benjamin Jowett, trans. Chicago: Henry Regnery.
- Plato. (1968) The Republic of Plato. Allan Bloom, trans. New York: Basic Books.
- Polanyi, Michael. (1948) Full Employment and Free Trade. Second edition. Cambridge: University Press.
- Polanyi, Michael. (1951) The Logic of Liberty: Reflections and Rejoinders. London: Routledge and Kegan Paul.
- Polanyi, Michael. (1955) "Words, Conceptions, and Science". Twentieth Century, 158 (September), 256-267.
- Polanyi, Michael. (1956) "This Age of Discovery". Twentieth Century, 159 (March), 227-234.
- Polanyi, Michael. (1961) "Faith and Reason". Journal of Religion, 41, No. 4, 237-247.
- Polanyi, Michael. (1962) "History and Hope". Virginia Quarterly Review, 38, No. 2, 177-195.
- Polanyi, Michael. (1964) Personal Knowledge. Chicago:

University of Chicago Press.

- Polanyi, Michael. (1964a) Science, Faith, and Society. Chicago: University of Chicago Press.
- Polanyi, Michael. (1965) "On the Modern Mind". Encounter, 24, 12-20.
- Polanyi, Michael. (1969) Knowing and Being. Marjorie Greene, ed. Chicago: University of Chicago Press.
- Polanyi, Michael. (1969a) The Study of Man. Chicago: University of Chicago Press.
- Polanyi, Michael. (1972) "Genius in Science". Encounter, 38, 43-50.
- Polanyi, Michael and Harry Prosch. (1977) Meaning. Chicago: University of Chicago Press.
- Poincare, Henri. (1914) Science and Method. Francis Maitland, trans. New York: Charles Scribner's Sons. Reprinted in part as "Mathematical Discovery" in Brown, ed. (1972, III: 11-19).
- Polsby, Nelson, R.A. Dentler, and P.S. Smith, eds. (1963) Politics and Social Life: An Introduction to Political Behavior. Boston: Houghton-Mifflin.
- Popper, Karl. (1950) "Indeterminism in Quantum Physics and in Classical Physics. Part I". The British Journal for the Philosophy of Science, (August), 117-133.
- Popper, Karl. (1950a) "Indeterminism in Quantum Physics and in Classical Physics. Part II". The British Journal for the Philosophy of Science, (November), 173-195.
- Popper, Karl. (1960) "On the Sources of Knowledge and Ignorance". Proceedings of the British Academy in London, 46, 39-71.
- Popper, Karl. (1962) Conjectures and Refutations. New York: Basic Books.
- Popper, Karl. (1964) The Poverty of Historicism. New York: Harper and Row.

- Popper, Karl. (1966) Of Clouds and Clocks: An Approach to the Problem of Rationality and the Freedom of Man. St. Louis: Washington University Press.
- Popper, Karl. (1966a) "A Theorem on Truth-Content". In Feyerabend and Maxwell, eds. (1966).
- Popper, Karl. (1966b) The Open Society and Its Enemies. In two volumes. Fifth edition, revised. Volume 1: The Spell of Plato. Volume 2: The High Tide of Prophecy: Hegel, Marx, and the Aftermath. Princeton: Princeton University Press.
- Popper, Karl. (1967) "Rationality and the Status of the Rationality Principle". Mimeograph.
- Popper, Karl. (1968) The Logic of Scientific Discovery. New York: Harper and Row.
- Popper, Karl. (1969) "The Moral Responsibility of the Scientist". Encounter, 32 (March), 52-54+.
- Popper, Karl. (1970) "Plato's Timaeus 54E-55A". Classical Review, 20 (March), 4-5.
- Popper, Karl. (1970a) "Normal Science and Its Dangers". In Lakatos and Musgrave, eds. (1970: 51-58).
- Popper, Karl. (1973) "Indeterminism is Not Enough: A Philosophical Essay". Encounter, 40 (April), 20-26.
- Popper, Karl. (1976) Unended Quest: An Intellectual Autobiography. La Salle, Ill.: Open Court.
- Popper, Karl. (1979) Objective Knowledge: An Evolutionary Approach. Oxford: Clarendon Press.
- Popper, Karl. (1979a) Truth, Rationality, and the Growth of Scientific Knowledge. Frankfurt am Main: Klostermann. Reprinted as Chapter 10 of Popper (1962).
- Popper, Karl. (1982) The Open Universe: An Argument for Indeterminism. Volume 1 of Postscript to The Logic of Scientific Discovery. W.W. Bartley III,

ed. Rowman.

- Popper, Karl. (1982a) Quantum Theory and the Schism in Physics. Volume 2 of Postscript to The Logic of Scientific Discovery. W.W. Bartley III, ed. Rowman.
- Popper, Karl. (1983) Realism and the Aim of Science. Volume 3 of Postscript to The Logic of Scientific Discovery. W.W. Bartley III, ed. Rowman.
- Porteous, N.W. (1960) "Review: Order and History (I-III)". English Historical Review, 70, 288-290.
- Porter, J.M. (1975) "A Philosophy of History as a Philosophy of Consciousness". In Corrington, ed. (1975: 96-104).
- Portis, E. B. (1983) "Max Weber and the Unity of Normative and Empirical Theory". Political Studies, 31, 25-42.
- Pritchard, J.B. (1958) "Review: Israel and Revelation." American Historical Review, 63, 640-644.
- Prosch, Harry. (1972) "Polanyi's Ethics". Ethics, 82, 91-113.
- Quine, Willard Van Orman. (1960) Word and Object. Cambridge: MIT Press.
- Quine, Willard Van Orman. (1974) "On Popper's Negative Methodology". In Schlipp, ed. (1974: 218-220).
- Quinton, A. (1973) "Sir Karl Popper: Knowledge as an Institution". Encounter, 41 (December), 33-37.
- Raab, Francis. (1968) "History, Freedom, and Responsibility". In Brodbeck, ed. (1968: 694-704).
- Rawls, John. (1971) A Theory of Justice. Cambridge: Harvard University Press.
- Reill, Peter Hans. (1975) The German Enlightenment and the Rise of Historicism. Berkeley: University of California Press.

- Rioci, David. (1977) "Reading Thomas Kuhn in the Post-Behavioral Era". World Politics Quarterly, 30 (March), 7-34.
- Richardson, Alan. (1964) History: Sacred and Profane. Philadelphia: Westminster Press.
- Roberts, Paul Craig. (1969) "Politics and Science: A Critique of Buchanan's Assessment of Polanyi". Ethics, 79, 235-241.
- Robinson, C.A. (1958) "Review: Order and History (II-III)". American Historical Review, 63, 939-941.
- Roettger, Walter B. (1977) "The Relevance of American Political Science: An Empirical Assessment". Paper presented to the annual meeting of the Western Political Science Association. March 31 - April 2, 1977. Phoenix, Arizona.
- Roettger, Walter B. (1977a) American Political Science in the "Post-Behavioral" Era: An Empirical Assessment of the Beliefs of a Discipline. Ph.D. Thesis. University of Colorado.
- Rosen, Stanley. (1958) "Order and History". Review of Metaphysics, 12, 257-276.
- Ross, Heather, and Isabel Sawhill. (1975) Time of Transition: The Growth of Families Headed by Women. Washington, D.C.: The Urban Institute.
- Rowley, H.H. (1957) "Review: Israel and Revelation". Journal of Biblical Literature, 75, 157-158.
- Rucker, Rudy. (1982) Infinity and the Mind: The Science and Philosophy of the Infinite. Boston: Birkhauser.
- Rudner, Richard. (1966) Philosophy of Social Science. Englewood Cliffs, N.J.: Prentice-Hall.
- Runciman, W.G. (1968) "Sociological Evidence and Political Theory". In Brodbeck, ed. (1968: 561-571).
- Russell, Bertrand. (1945) A History of Western Philosophy. New York: Simon and Schuster.

- Salmon, Wesley, ed. (1971) Statistical Explanation and Statistical Relevance. Pittsburgh: University of Pittsburgh Press.
- Salmon, Wesley. (1971a) "Statistical Explanation". In Salmon, ed. (1971: 29-88).
- Sandoz, Ellis. (1961) "Review: Order and History (I-III)". Social Research, 28, 85-87.
- Sandoz, Ellis. (1962) "Voegelin's Idea of Historical Form". Cross Currents, 12, 41-63.
- Sandoz, Ellis. (1968) "The Science and Demonology of Politics". Intercollegiate Review, 4, 117-123.
- Sandoz, Ellis. (1969) "Eric Voegelin and the Nature of Philosophy". Modern Age, 13, 152-168.
- Sandoz, Ellis. (1971) "The Foundations of Voegelin's Political Theory". Political Science Reviewer, 1, 30-73.
- Sandoz, Ellis. (1972) "The Philosophical Science of Politics Beyond Behavioralism". In Graham and Carey, eds. (1972: 285-305).
- Sandoz, Ellis. (1973) "Voegelin Read Anew: Political Philosophy in the Age of Ideology". Modern Age, 17, 257-263.
- Sandoz, Ellis. (1981) The Voegelinian Revolution. Baton Rouge: Louisiana State University Press.
- Sandoz, Ellis, ed. (1982) Eric Voegelin's Thought. Durham, N.C.: Duke University Press.
- Schwarzschild, Leopold. (1947) The Red Prussian. Margaret Wing, trans. New York: Grosset and Dunlap.
- Scriven, Michael. (1959) "Truisms as the Grounds for Historical Explanation". In Gardiner, ed. (1959: 443-475).
- Scullard, H.H. (1959) "Review: Order and History (I-III)". History, 44, 33-34.
- Sebba, Gregor. (1957) "Societies and Symbols".

- Christian Century, 54, 894.
- Sebba, Gregor. (1967) "Order and Disorders of the Soul: Eric Voegelin's Philosophy of History". Southern Review, 3, 282-310.
- Sebba, Gregor. (1975) "Eric Voegelin: From Enlightenment to Universal Humanity". Southern Review, 11, 918-925.
- Sebba, Gregor. (1977) "Prelude and Variations on the Theme of Eric Voegelin". Southern Review, 13.
- Sederberg, Peter C. (1982) "The Politics of Scientific Inquiry: Scientific Method and the Control of Shared Meaning". Presented at the annual meeting of the Southern Political Science Association. October 28-30, 1982. Atlanta, Georgia.
- Shinn, R.L. (1957) "Societies and Symbols". Christian Century, 54, 894.
- Shinn, R.L. (1958) "Another Leap of Being". Christian Century, 55, 1053-1054.
- Smith, Page. (1964) "Spengler, Toynbee and Voegelin". In The Historian and History. New York: Knopf. 98-109.
- Somit, Albert and Joseph Tannenhaus. (1964) American Political Science: A Profile of a Discipline. New York: Atherton Press.
- Somit, Albert and Joseph Tannenhaus. (1967) The Development of American Political Science. Boston: Allyn and Bacon.
- Spengler, Oswald. (1926) The Decline of the West: Form and Actuality. Charles Francis Atkinson, trans. New York: A.A. Knopf.
- Stark, Franz. (1971) Revolution oder Reform? Herbert Marcuse u. Karl Popper: Eine Konfrontation. Munchen: Kosel. Translated in Ferguson, ed. (1976).
- Tarski, Alfred. (1965) Introduction to Logic and to the Methodology of Deductive Sciences. New York: Oxford University Press.

- Taylor, Paul. (1975) Principles of Ethics: An Introduction. Encino, California: Dickenson Publishing Co., Inc.
- Taylor, Richard. (1983) Metaphysics. Third edition.. Englewood Cliffs, N.J.: Prentice-Hall.
- Tilley, N. (1980) "Popper, Positivism, and Ethnomethodology". British Journal of Sociology, 31 (March), 28-45.
- Toynbee, Arnold. (1961) A Study of History. Twelve volumes. London: Oxford University Press, 1934-1961.
- Toynbee, Arnold. (1968) "Indivisibility and Unpredictability in Human Affairs". In Kuntz, ed. (1968: 43-59).
- Trefil, James S. (1978) "Missing Particles Cast Doubt on Our Solar Theories". Smithsonian Magazine, (March), 74-83.
- Truman, David B. (1969) "The Impact on Political Science of the Revolution in the Behavior Sciences". In Eulau, ed. (1969: 38-67)
- Tucker, Robert, ed. (1978) The Marx-Engels Reader. Second edition. New York: W.W. Norton and Co., Inc.
- Turchin, Valentin. (1977) The Phenomenon of Science. New York: Columbia University Press.
- Van Heijenoort, Jean, ed. (1980) Frege and Godel: Two Fundamental Texts in Mathematical Logic. Cambridge: Harvard University Press.
- Ventris, Michael and John Chadwick. (1959) Documents in Mycenaean Greek. Cambridge: University Press.
- Vernon, Richard. (1976) "The Great Society and the Open Society: Liberalism in Hayek and Popper". Canadian Journal of Political Science, 9 (June), 261-276.
- Voegelin, Eric. (1927) "Kelsen's Pure Theory of Law". Political Science Quarterly, 42, 268-276.

- Voegelin, Eric. (1933) Der Autoritaere Staat. Vienna: Springer.
- Voegelin, Eric. (1933a) Rasse und Staat. Tuebingen: J.C.B. Mohr.
- Voegelin, Eric. (1933b) Die Rassenidee in der Geistesgeschichte von Ray bis Carus. Berlin: Junker und Duennhaupt.
- Voegelin, Eric. (1938) Die politischen Religionen. Vienna: Bermann-Fischer.
- Voegelin, Eric. (1939) "Review of The Ruling Class by Gaetano Mosca". Journal of Politics, 1, 434-436.
- Voegelin, Eric. (1940) "Extended Strategy: A New Technique of Dynamic Relations". Journal of Politics, 2, 189-200.
- Voegelin, Eric. (1940a) "The Growth of the Race Idea". Review of Politics, 2, 283-317.
- Voegelin, Eric. (1941) "The Mongol Orders of Submission to European Powers, 1245-1255". Byzantion, 15, 378-413.
- Voegelin, Eric. (1941a) "Right and Might: a Review of Law, the State, and the International Community by James Brown Scott". Review of Politics, 3, 122-123.
- Voegelin, Eric. (1941b) "Two Recent Contributions to the Science of Law: a Review of Introduction to the Sociology of Law by N.S. Timasheff, and Jurisprudence, by Edgar Bodenheimer". Review of Politics, 3, 339-404.
- Voegelin, Eric. (1941c) "Some Problems of German Hegemony". Journal of Politics, 3, 154-168.
- Voegelin, Eric. (1942) "The Theory of Legal Science: A Review". Louisiana Law Review, 4, 554-572.
- Voegelin, Eric. (1942a) "Review of The Structure of the Nazi Economy, by Maxine Y. Sweezy, and The Dual State, by Ernst Fraenkel". Journal of Politics, 4, 269-272.

- Voegelin, Eric. (1944) "Nietzsche, the Crisis, and the War". Journal of Politics, 6, 177-212.
- Voegelin, Eric. (1944a) "Political Theory and the Pattern of General History". American Political Science Review, 38, 746-754.
- Voegelin, Eric. (1944b) "Review of The Decline of Liberalism, by John Hallowell". Journal of Politics, 6, 107-109.
- Voegelin, Eric. (1945) "Review of Contemporary Italy: Its Intellectual and Moral Origins, by Count Carlo Sforza". Journal of Politics, 7, 94-97.
- Voegelin, Eric. (1946) "Bakunin's Confession". Journal of Politics, 8, 24-43.
- Voegelin, Eric. (1946a) "Review of Soviet Politics, At Home and Abroad, by Fred L. Schuman". Journal of Politics, 8, 212-220.
- Voegelin, Eric. (1946b) "Review of The Lessons of Germany, by G. Eisler, et al". American Political Science Review, 40, 385-386.
- Voegelin, Eric. (1947) "Plato's Egyptian Myth". Journal of Politics, 9, 307-324.
- Voegelin, Eric. (1947a) "Review of The Myth of the State, by Ernst Cassirer". Journal of Politics, 9, 445-447.
- Voegelin, Eric. (1947b) "Review of Post-War Governments of Europe, ed. by D. Fellman". American Political Science Review, 41, 595-596.
- Voegelin, Eric. (1947c) "Review of Soviet Legal Theory: Its Social Background". Journal of Politics, 9, 129-131.
- Voegelin, Eric. (1948) "The Origins of Scientism". Social Research, 15, 462-494.
- Voegelin, Eric. (1948a) "Review of Homo Ludens, by J. Huizinga". Journal of Politics, 10, 179-187.
- Voegelin, Eric. (1948b) "Political Theory and the Pattern of General History". In Griffith, ed.

- (1948: 190-201).
- Voegelin, Eric. (1949) "The Philosophy of Existence: Plato's Gorgias". Review of Politics, 11, 477-498.
- Voegelin, Eric. (1949a) "Review of Western Political Thought, by John Bowle". Review of Politics, 11, 262-263.
- Voegelin, Eric. (1949b) "Review of On Tyranny, by Leo Strauss". Review of Politics, 11, 241-244.
- Voegelin, Eric. (1950) "The Formation of the Marxian Revolutionary Idea". Review of Politics, 12, 275-302. Reprinted in Fitzsimmons, et al (1959: 265-281).
- Voegelin, Eric. (1950a) "Review of The New Science, by Giovanni Battista Vico". Catholic Historical Review, 35, 75-76.
- Voegelin, Eric. (1951) "Machiavelli's Prince: Background and Formation". Review of Politics, 13, 142-168.
- Voegelin, Eric. (1952) The New Science of Politics: An Introduction. Chicago: University of Chicago Press.
- Voegelin, Eric. (1952a) "Goethe's Utopia". In Hammer, ed. (1952: 55-62).
- Voegelin, Eric. (1953) "The Origins of Totalitarianism". Review of Politics, 15, 68-76. See Arendt (1953) for a reply.
- Voegelin, Eric. (1953a) "The Oxford Political Philosophers". Philosophical Quarterly, 3, 97-114.
- Voegelin, Eric. (1953b) "The World of Homer". Review of Politics, 3, 491-523.
- Voegelin, Eric. (1954) "Review of Plato's Modern Enemies and the Theory of Natural Law, by John Wild, and In Defense of Plato, by Ronald B. Levinson". American Political Science Review, 48, 859-862.

- Voegelin, Eric. (1956) Israel and Revelation. Volume I of Order and History. Baton Rouge: Louisiana State University Press.
- Voegelin, Eric. (1956a) "Necessary Moral Bases for Communication in a Pluralistic Society". Problems of Communication in a Pluralistic Society. Milwaukee: Marquette University Press.
- Voegelin, Eric. (1957) The World of the Polis. Volume II of Order and History. Baton Rouge: Louisiana State University Press.
- Voegelin, Eric. (1957a) Plato and Aristotle. Volume III of Order and History. Baton Rouge: Louisiana State University Press.
- Voegelin, Eric. (1959) Wissenschaft, Politik und Gnosis. Munich: Koesel. Translated in Voegelin (1968).
- Voegelin, Eric. (1959a) "On Readiness to Rational Discussion". In Hunold, ed. (1961: 269-284).
- Voegelin, Eric. (1960) "Historiogenesis". Philosophisches Jahrbuch, 68. Reprinted in Voegelin (1966). Reprinted, translated and expanded in Voegelin (1975).
- Voegelin, Eric. (1960a) "Industrial Society in Search of Reason". In Aron, ed. (1963: 31-46).
- Voegelin, Eric. (1961) "Toynbee's History as a Search for Truth". In Gargan, ed. (1961: 181-98).
- Voegelin, Eric. (1962) "World Empire and the Unity of Mankind". International Affairs, 38, 170-188.
- Voegelin, Eric. (1966) Anamnesis: Zur Theorie der Geschichte und Politik. Munich: Piper.
- Voegelin, Eric. (1967) "On Debate and Existence". Intercollegiate Review, 3, 143-152.
- Voegelin, Eric. (1967a) "Immortality, Experience, and Symbol". Harvard Theological Review, 60, 235-279.
- Voegelin, Eric. (1968) Science, Politics, and Gnosticism. William J. Fitzpatrick, trans.

Chicago: Henry Regnery.

- Voegelin, Eric. (1968a) "Configurations of History". In Kuntz, ed. (1968: 23-42).
- Voegelin, Eric. (1969) "History and Gnosis". In Anderson, ed. (1969: 64-89).
- Voegelin, Eric. (1970) "The Eclipse of Reality". In Natanson, ed. (1970: 185-194).
- Voegelin, Eric. (1970a) "Equivalences of Experience and Symbolization in History". Eternitz e Storia: I valori permanenti nel divinare storico. Florence: Valecchi.
- Voegelin, Eric. (1971) "The Gospel and Culture". In Miller and Hadidian, eds. (1971: 59-101).
- Voegelin, Eric. (1971a) "On Hegel: A Study in Sorcery". Studium General, 24, 335-368.
- Voegelin, Eric. (1971b) "Henry James' 'The Turn of the Screw'". Southern Review, 7, 3-48.
- Voegelin, Eric. (1973) "On Classical Studies". Modern Age, 17, 2-8.
- Voegelin, Eric. (1973a) "Philosophers of History". New Orleans Review, 2, 135-139.
- Voegelin, Eric. (1974) "Liberalism and Its History". Review of Politics, 37, 504-520.
- Voegelin, Eric. (1974a) "Reason: The Classic Experience". The Southern Review, 10, 237-264.
- Voegelin, Eric. (1975) The Ecumenic Age. Volume IV of Order and History. Baton Rouge: Louisiana State University Press.
- Voegelin, Eric. (1975a) From Enlightenment to Revolution. James Hallowell, ed. Durham, N.C.: Duke University Press.
- Voegelin, Eric. (1975b) "Response to Professor Altizer". Journal of the American Academy of Religion, 43, 765-772.

- Voegelin, Eric. (1978) Anamnesis. Gerhart Niemeyer, trans. Notre Dame: University of Notre Dame Press.
- Voegelin, Eric. (1982) "The American Experience". Modern Age, 26, Nos. 3-4, 332-333.
- Von Neumann, John, and Oskar Morganstern. (1947) Theory of Games and Economic Behavior. Princeton: Princeton University Press.
- Walsh, W.H. (1959) "Meaning in History". In Gardiner, ed. (1959).
- Wand, Bernard. (1953) "Review: The New Science of Politics". Philosophical Review, 62, 608-609.
- Walsh, David. (1976) "Philosophy in Voegelin's Work". Presented at the annual meeting of the American Political Science Association. September 3, 1976.
- Weatherby, Harold L. (1978) "Myth, Fact, and History: Voegelin and Christianity". Modern Age, 22, 144-150.
- Webb, Eugene. (1978) "Eric Voegelin's Theory of Revelation". The Thomist, 42, 95-122.
- Webb, Eugene. (1981) Eric Voegelin: Philosopher of History. Seattle: University of Washington Press.
- Weber, Max. (1958) The Protestant Ethic and the Spirit of Capitalism. Talcott Parsons, trans. New York: Charles Scribner's Sons.
- Weber, Max. (1968) "'Objectivity' in Social Science". In Brodbeck, ed. (1968: 85-97).
- Weber, Max. (1968a) "Ideal Types and Theory Construction". In Brodbeck, ed. (1968: 496-507).
- Wilhelmsen, F.D. (1975) "Review: The Ecumenic Age". Triumph, (January), 32-35.
- Wilkins, Burleigh Taylor. (1978) Has History Any Meaning? Cornell University Press.

- Wilson, F.G. (1953) "Review: The New Science of Politics". American Political Science Review, 47, 542-543.
- Winch, Peter. (1970) The Idea of a Social Science and Its Relation to Philosophy. London: Routledge and Kegan Paul.
- Wiser, James L. (1972) "Philosophy and Human Order". Political Science Reviewer, 2, 137-161.
- Wiser, James L. (1975) "Eric Voegelin and the Eclipse of Philosophy". In Corrington, ed. (1975: 108-114).
- Wiser, James L. (1977) "Knowledge and Order: A Review of Michael Polanyi's Personal Knowledge". Political Science Reviewer, 7, 91-110.
- Wiser, James L. (1978) "Philosophy as Inquiry and Persuasion". In McKnight, ed. (1978: 127-138).
- Wiser, James L. (1980) "From Cultural Analysis to Philosophical Anthropology: An Examination of Voegelin's Concept of Gnosticism". Review of Politics, 42, 92-104.
- Wiser, James L. (1981) "Eric Voegelin and a New Science of Politics". Presented at the annual meeting of the Southern Political Science Association. November 5-7, 1981. Memphis, Tennessee.

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- Instructor, Department of History and Political Science, Berea College, 1981 - 1984
- Associate Instructor, Department of Political Science, Indiana University, Summer, 1978 (Taught Introduction to American Politics)
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- Science, Indiana University, 1978 - 1980 (Archivist for Data Lab -- programming, data processing, tape archive maintenance, statistical consultation)
- Research Assistant, Department of Political Science, Indiana University, under a grant from the Center for International Policy Studies, Spring, 1978 (Analysis of Foreign Policy Voting Decisions in the U.S. Senate for Leroy Rieselbach)
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- Chair, Ad Hoc Committee on Prelaw Education, 1983 - present
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- Member of Committee and Co-author of Self-Study Report for Department of History and Political Science, Berea College, 1982 - 1983
- Coordinator, Begley-Van Cleve Lectureship, 1983 - present
- Prelaw Advisor, 1983 - present
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- Member, Midwest Political Science Association, 1981 - present
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- Political theory and philosophy
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- A study of Popper's "Theory of Frequency of Finite Classes"
- A study of Plato's conception of Love and the Individual
- A study of Frege's Basic Laws of Arithmetic and Begriffsschriften
- with Richard Merriman, a proposal to teach a funded seminar for Kentucky secondary school teachers on the development of Constitutional principles during the early period of the American Republic