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THE UNITY OF THE EPISTEMOLOGY
OF C. S. PEIRCE

by

WALTER RICHARD BLACK

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

DOCTOR OF PHILOSOPHY

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MAY, 1982
ABSTRACT

THE UNITY OF THE EPISTEMOLOGY OF C. S. PEIRCE

by

Walter Richard Black

The underlying raison d'être of the work is that, despite the large amount of scholarship which has gone into the analysis and criticism of the philosophy of Charles S. Peirce in the past thirty-five years, commentators have inadequately perceived—and at times denied—the relationship of Peirce's pragmatic theory of meaning to the other basic elements of his epistemology. This study attempts to rectify this oversight by exposing the logical interdependence of the core concepts of that epistemology—that is, Peirce's notions of meaning, truth, and reality—within a distinctive pragmatic framework and showing the manner in which his two main doctrines concerning the nature and limitations of human knowledge, fallibilism and critical common-sensism, fold neatly into that framework.

The study consists of three distinct but intimately related phases. First of all, there is the tracing of the roots of the pragmatic theory of meaning and the Peircean notions of truth and reality (Chapters I through III). The central contention developed in this phase is that Peirce's
idiosyncratic conceptions of truth and reality are built into the theory of meaning and that all three of these elements of his epistemology derive their character from the neo-phenomenalistic perspective which serves as their matrix. The second phase (Chapter IV) extends this unifying analysis to the doctrines of fallibilism and critical common-sensism. It is therein shown that both of these doctrines are implicit in the assumptions upon which the interrelated views of meaning, truth, and reality are founded. Taken together, the first two phases of the study build a new case for assigning the label "pragmatism" to the main body of Peirce's epistemology, rather than restricting it (in the traditional manner) to his criterion of meaning.

In the final phase of the study (Chapters V and VI) the findings of the earlier pages are reinforced and accorded additional depth by exploring the relevance of Peirce's unified epistemology to two issues of moment in contemporary epistemology and philosophy of science, namely, the confirmability of empirical hypotheses and the doctrine of theory-dependent meaning.
"I suppose I may take it for granted that you all know what pragmatism is. I have met with a number of definitions of it lately, against none of which I am much disposed to raise any violent protest. Yet to say exactly what pragmatism is describes pretty well what you and I have to puzzle out together."

-- Charles S. Peirce
Notation

In the interests of clarity and typographical economy, and in keeping with common practice in Peirce scholarship, quotations from the *Collected Papers of Charles Sanders Peirce* (Cambridge, Massachusetts: volumes one through six, 1931-1935, edited by Charles Hartshorne and Paul Weiss; volumes seven and eight, 1958, edited by Arthur Burks) which appear in the main body of the text will be referenced there, rather than in footnotes. The references are structured such that the number to the left of the period reflects the volume in which the quotation appears, and the number to the right of the period indicates the number of the paragraph where the quotation may be found. Thus, for example (2.167) refers to Volume 2, paragraph 167 of the *Collected Papers*. 
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INTRODUCTION

Ever since the turn of the Twentieth Century, pragmatism has been the one philosophical doctrine most often associated with the name of Charles Sanders Peirce. With the publication of the first six volumes of his Collected Papers in the early 1930's, there began a slow but steadily growing trend toward the exposition and re-evaluation of Peirce's writings which has continued to the present day, but pragmatism still remains one of the major focal points of interest in his philosophy. Inasmuch as Peirce took the trouble to coin the term "pragmaticism" in order to distinguish his own peculiar species of pragmatism from that of William James, there has been an understandable tendency on the part of Peirce scholars to avoid duplicating James's famous distortions of Peirce's doctrine. This tendency is sometimes instanced by scrupulous efforts to establish and reinforce the point that Peirce's pragmatism is, after all, a criterion of meaning and, hence, is not to be confused with any Jamesian criterion or theory of truth. W. B. Gallie, for example, goes so far as to state:

Peirce's Pragmatism has no direct bearing on the question of truth or falsity—except that our conceptions of truth and justifiability are among those that require to be articulated by means of the Pragmatist maxim.3
This position seems to me to be both profoundly in error and a major impediment to a proper understanding and evaluation of Peirce's epistemology. (Peirce himself—in a letter not published until after the initial appearance of Gallie's book—characterizes his own version of pragmatism as "the doctrine that truth consists in future serviceableness for our ends."\(^4\)) In a sense then, my study will represent an attempt at conclusively and fairly comprehensively refuting that position. I shall attempt to demonstrate that pragmatism as a criterion of meaning not not only has "a direct bearing" on Peirce's theory of truth, but that the two are so inextricably meshed logically by a chain of common assumptions that the acceptance of one essentially entails the affirmation of the other. This attempt in effect amounts to a portrayal of Peirce's pragmatism as a unified epistemological theory in which the pragmatic criterion of meaning and the pragmatic conception of truth are pivotal and interdependent facets.

A problem we are faced with in undertaking a discussion of the links existing among elements of Peirce's epistemology is one that is rather common to most areas of Peirce commentary—namely, that Peirce himself volunteers little assistance in making explicit the sorts of relationships which should and do obtain. His first public rendition of pragmatism appeared in the second\(^5\) of a series of six papers written for publication in the Popular Science Monthly
during 1877 and 1878. After articulating the now famous
criterion of meaning ("Consider what effects, which might
conceivably have practical bearings, we conceive the object
of our conception to have. Then, our conception of these
effects is the whole of our conception of the object."
(5.402)), Peirce employs that criterion to generate his
"exceedingly puzzling" joint definitions of truth and
reality:

The opinion which is fated to be
ultimately agreed to by all who in-
vestigate, is what we mean by the
truth, and the object represented in
this opinion is the real. (5.407)

Peirce elaborates, but doesn't really do a great deal
toward clarifying what he is getting at:

Reality is independent, not necessarily
of thought in general, but only of
what you or I or any finite number of
men may think about it; and ... though
the object of the final opinion depends
on what that opinion is, yet what that
opinion is does not depend on what you
or I or any man thinks. (5.408)

One is heartened by the closing statement of the article,
in which Peirce declares that now that he has shown us how
to make our ideas clear, he will next discuss how to make
them true (5.410) but, alas, the last four articles in the
series are taken up with rather technical treatments of
such topics as probability theory, the different modes of
inference, and "the order in nature"; and the definitions of
truth and reality are not further elucidated, at least not
in anything resembling an explicit manner. Nor does Peirce
backtrack to indicate how these definitions might be involved in the same theoretical nexus with the criterion of meaning that was the source of their generation. The reader, therefore, would seem to be fully warranted in assuming, as Gallie apparently did, that Peirce's pragmatic criterion of meaning has no more in common with the definitions of 'truth' and 'reality' than it does with the definitions of 'hardness', 'weight', and 'force', i.e., other concepts whose meanings Peirce evinces through application of the pragmatic maxim in the How To Make Our Ideas Clear article.

To make matters still more difficult, the reader of Peirce who attempts to locate the threads binding the substance of the Popular Science articles together must take into account the fact that Peirce came to revise some important aspects of the views expressed in the later articles, that he on numerous occasions in subsequent years rephrased the wording of the pragmatic criterion of meaning, and that he made at least one major modification in framing the immediate implications which follow from acceptance of that criterion. To rediscover those threads and use them to tie together the Peircean theories of meaning and truth is one of the major tasks to which this study will direct itself.

Chapters I, II, and III will consist in a tracing of the logical lines of interconnection obtaining among the
Peircean conceptions of meaning, truth, and reality. (For reasons that will become clear—particularly in Chapter III—it would be impossible to faithfully trace the linkage between Peirce's pragmatic theories of meaning and truth without giving substantial recognition to the functional importance his distinctive notion of reality plays in that linkage.) This "tracing" will take us through certain areas of Peirce's philosophical interests that, superficially at least, might appear to have little relevance to the nature of the epistemological concepts which will be our focus, but the approach that will be taken appears to me to offer maximum promise for facilitating the development of a coherent account of the concepts in question. (As we shall see very shortly, the expository format of the first two chapters is structured with an eye to Peirce's "classification of the sciences.")

In Chapter IV we will go on to examine Peirce's two main doctrines concerning the character and attainability of human knowledge, Fallibilism and Critical Common-sensism. The primary goal there will be to show how these two doctrines logically interlock with the core concepts of Peirce's epistemology (i.e., his notions of meaning, truth, and reality) to form an intricate whole which is Peirce's pragmatism.

P. F. Strawson has aptly remarked that:

No philosopher understands his predecessors until he has re-thought
their thought in his own contemporary terms; and it is characteristic of the very greatest philosophers, like Kant and Aristotle, that they, more than any others, repay this effort of re-thinking.

The last two chapters of this paper will represent an attempt to "re-think" Peirce's pragmatic epistemology in terms relating to a pair of issues that have figured prominently in Twentieth Century epistemology and philosophy of science. Chapter V will deal with an issue having to do with the confirmability of empirical hypotheses. In comparing and contrasting Peirce's views on this matter with those of certain more recent philosophers, I hope to at least partially resolve what superficially appears to be a tension (or even contradiction) existing between Peirce's fallibilism and his 'common-sensist' notion of indubitability. To the extent that such resolution is attained, it will help support and reinforce the unified picture of Peirce's epistemology developed in the preceding chapters. In Chapter VI, I will further expand my central thesis concerning the logical interdependence of Peirce's theories of meaning, truth, and reality by showing (contrary to the opinions of certain prominent commentators) that his epistemological framework favors a rather controversial present-day view concerning the relationship of meaning-ascriptions to truth-claims, the doctrine of theory-dependent meaning.
Some Remarks on Structure

That Peirce desired and intended to construct a vast, imposing "architectonic" system is clear. It was his stated aim:

\[\ldots\] to make a philosophy like that of Aristotle, that is to say, to outline a theory so comprehensive that, for a long time to come, the entire work of human reason, in philosophy of every school and kind, in mathematics, in psychology, in physical science, in history, in sociology, and in whatever other department there may be, shall appear as the filling up of its details.

(1.1)

Whether such a system is implicit in the great sea of Peirce's scattered writings is a point very much disputed among Peirce scholars. Fortunately, for the purposes of our study we may sidestep the larger issue concerning the possible shape and comprehensiveness of an entire Peircean system, since our endeavor is only to discover such systematization as determines the nature of Peirce's conceptions of meaning, truth, and reality in our attempt to exhibit their coherence and some of the important relationships existing among them. But since we are going to try to find common bases for the positions which Peirce maintained with respect to those notions, we would be well advised to be as careful as possible that the point of departure for our inquiry will be at the taproot leading to the core of Peirce's epistemology. One difficulty that
immediately stands in the way of the search for such an ideal starting point—besides, of course, the fragmentary nature of many of his writings—is Peirce's own idea of proper philosophical methodology. One finds in Peirce no Cartesian chain of reasonings tracing back to an indubitable premiss, nor should one expect to find such a chain:

Philosophy ought to imitate the successful sciences in its methods, so far as to proceed only from tangible premisses which can be subjected to careful scrutiny, and to trust rather to the multitude and variety of its arguments than to the conclusiveness of any one. Its reasonings should not form a chain which is no stronger than its weakest link, but a cable whose fibers may be ever so slender, provided they are sufficiently numerous and intimately connected.

(5.253)

With respect to Peirce's pragmatic criterion of meaning, his theory of truth, and his concept of reality, the search for a clear and unique starting point from which these may be derived in clean and simple fashion is especially frustrating, for Peirce saw a number of not obviously related considerations as bearing directly upon his pragmatic epistemology. Thus, to arrive at a proper understanding of that epistemology, it seems wise to select a modus operandi that will allow us to pass readily through several distinct areas of Peirce's wide range of intellectual pursuits. Nothing would facilitate matters more, I believe, than attuning our approach to Peirce's own "Classification of the Science," and to this we shall now briefly look.
For Peirce, science is defined not as a mere body of knowledge but rather as **purposive activity**, the goal of which is the attainment of knowledge. In the manuscript for his never-completed *History of Science*, he says:

(Science) ... does not consist so much in knowing, nor even in 'organized knowledge,' as it does in diligent inquiry into truth for truth's sake, without any sort of axe to grind, nor for the sake of the delight of contemplating it, but from an impulse to penetrate into the reason of things (1.44).

Inasmuch as the different modes of activity known as the different sciences have certain important relationships to one another, Peirce appropriates as his ordering principle for the schematic classification of sciences an idea he acknowledges as belonging to Comte, "namely, the idea that one science depends upon another for fundamental principles, but does not furnish such principles to that other" (1.180).

Peirce's first broad division is into the two branches of science: theoretical science, "whose purpose is simply and solely knowledge of God's truth" (1.239), and practical science, serving the "uses of life." Practical science is dependent on theoretical science, but for Peirce it hardly fits the definition of "science" cited above, and so he doesn't bother to establish any order of divisions within it.9

Theoretical science is divided into two sub-branches—the sciences of discovery and those of review. A science of
review is defined as "the business of those who occupy themselves with arranging the results of discovery, beginning with digests, and going on to endeavor to form a philosophy of science" (1.182). Thus, the classification of sciences is itself a function of the sciences of review, and all the latter are dependent upon the sciences of discovery for their subject matter.

Within the sciences of discovery there is a trichotomous division into the classes of mathematics, philosophy, and idioscopy. Philosophy draws principles from mathematics but, according to Peirce's order of classification, the converse does not hold. Idioscopy is the class of sciences which rely upon special observation--e.g., laboratory experiment--and is comprised of the physical and "psychical" sciences. Since mathematics and philosophy are "prior" to idioscopy in Peirce's order of classification and as such draw no principles from the latter science, and since in this paper we are ultimately only concerned with gaining insight into certain of Peirce's philosophical views, I think we can dispense with consideration of the divisions which he goes on to delineate within idioscopic science.

In the first chapter of this study I will touch on Peirce's work in the field of mathematics only long enough to extract a couple of considerations that will prove to have significant bearing on those facets of Peirce's philosophy which form the focus of our investigation. Within philosophy itself, Peirce distinguishes three
"orders"—phaneroscopy (phenomenology), normative science (which is comprised of esthetics, ethics, and logic), and metaphysics. We will have reason to devote a good deal of space in our first chapter to Peirce's phaneroscopic studies. Then, after some fairly brief remarks concerning certain of his views on esthetics and ethics, the remainder of that chapter will be devoted to consideration of Peirce's researches in that "sub-order" of logic which he terms speculative grammar (theory of signs), researches which form the bedrock of Peirce's pragmatic theory of meaning.

In Chapter II we will explore at some length Peirce's work in the second "sub-order" of logic—critic (theory of inference) "which classifies arguments and determines the validity and degree of force of each kind" (1.191). This treatment will prove to be of the utmost importance in facilitating the uncovering of the fundamental interdependence of Peirce's conceptions of meaning, truth, and reality; and, indeed, as we proceed through the variety of topics encompassed in the remaining four chapters it will become increasingly clear that it is primarily Peirce's theory of inference which provides the cement binding together all the major facets of his epistemology.

With the treatment in Chapter II of Peirce's work within the field of critic, we will have laid out most of the tools needed for generating further insights into his epistemology, and we will then be able to dispense with any further
structural adherence to his order of classification of the sciences.

Two comments are in order at this point. First, our proceeding in accordance with Peirce's table of the order of the sciences should not be construed as approval of his system of classification. For our purposes we are only concerned with the logical order of those of Peirce's researches which inform his pragmatic epistemology. Whether his system provides insight into any order which the sciences must or do take in general, or whether Peirce constructed the table after the fact of his own patterns of procedure, is beside the point. Secondly, it may be noted that in one of his last writings on the subject of pragmatism Peirce reminisces over the period in his youth when, as a member of the "Metaphysical Club," he first formulated the pragmatic maxim and says:

Nicholas St. John Green...often urged the importance of applying (Alexander)
Bain's definition of belief, as 'that upon which a man is prepared to act.'
From this definition, pragmatism is scarce more than a corollary... .
(5.12)

Pragmatism does indeed hook up nicely with a Bainian style analysis of belief as 'a habit of, or disposition for, action', as we shall see later; but we would do well to notice that Peirce also characterizes the nature and derivation of pragmatism in a number of other intriguing ways, for example:
If you carefully consider the question of pragmatism you will see that it is nothing else than the question of the logic of abduction (5.196).

Pragmaticism is simply the doctrine that the inductive method is the only essential to the ascertainment of the intellectual purport of any symbol (8.209).

Pragmaticism could hardly have entered a head that was not already convinced that there are real generals (5.503).

. . .the pragmatist holds and must hold . . .that the third category—the category of thought, representation, triadic relation, mediation, genuine thirdness, thirdness as such—is an essential ingredient of reality, yet does not by itself constitute reality. . . . The truth is that pragmaticism is closely allied to the Hegelian absolute idealism. . . (5.436).

I myself happen, in common with a small but select circle, to be a pragmatist, or 'radical empiricist' . . . (7.617).

Pragmatism is a species of prope-positivism (5.413).

I have myself called pragmatism 'critical common-sensism', but, of course, I do not mean this for a strict definition (5.494).

I call my form of (pragmatism) conditional idealism (5.494).

This (pragmatic) maxim is put forth neither as a handy tool to serve so far as it may-be found serviceable, nor as a self-evident truth, but as a far-reaching theorem solidly grounded upon an elaborate study of the nature of signs (8.191).

Therefore, I think it would be a mistake to attempt to expedite our study by jumping ahead to Peirce's dispositional analysis of belief and dispensing with brief examination of
his relevant findings in the fields of mathematics, phaneroscopy, and logic. To do so would foster a counter-productive oversimplification which would leave the relationships between his notions of meaning, truth, and reality as unclear as they were in those original papers of the 1870's.
Notes to **INTRODUCTION**

1 A term "which is ugly enough to be safe from kidnappers" (5.414). With some exceptions, the term "pragmatism," rather than "pragmaticism" will be used throughout this paper. In Peirce's own surviving writings, after all, "pragmatism" appears with much greater frequency than does its rather homely cousin.

2 And that of F. C. S. Schiller, a British philosopher who was the author of, among other things, Personal Idealism (1902) and Humanism: Philosophical Essays (1903), two works that Peirce was apparently quite familiar with. Schiller's views, however, have apparently stirred little interest on the part of authors concerned with pragmatism. In fact, philosophical posterity in general has been rather cold to Schiller, judging from the fact that apparently the only edition of his work currently in print is a paperback compendium of bits and pieces of his (prolific) original writings: Humanistic Pragmatism: The Philosophy of F. C. S. Schiller, edited by Reuben Abel (New York, The Free Press, 1966). It also seems quite probable that even in Peirce's own mind—given the personal friendship that existed between himself and James—the latter's free interpretation of the meaning and significance of pragmatism were somewhat more disturbing than were the views of Schiller.

3 W. B. Gallie, Peirce and Pragmatism (New York, Dover Publications, 1966), p. 26. Similarly, Murray G. Murphey, another respected Peirce scholar, remarks in his article on Peirce in The Encyclopedia of Philosophy (New York, Macmillan, 1972), Vol. 5, p. 73: "As Peirce defined it, pragmatism is purely a theory of meaning—not of truth." Not all commentators depict Peirce's theories of meaning and truth as heterogenous doctrines however. A. J. Ayer, for example, in his The Origins of Pragmatism (London, Macmillan, 1968), p. 73, notes that "Peirce's theory of meaning dovetails into his theory of truth." Ayer, though, is simply referring to the fact that while the theory of meaning construes meaning as residing in a set of conceived observations, "the effect of making these observations is just to confirm me in the belief that the proposition is true" (pp. 72-73). He immediately lets the matter drop and moves on to other topics.

Peirce and Pragmatism was first published by Penguin Books (London) in 1952.

5"How to Make Our Ideas Clear" (5.388-410).


8E.g., compare J. K. Feibleman's An Introduction to Peirce's Philosophy (New York, Harper and Bros., 1946) and T. A. Goudge's The Thought of C. S. Peirce (Toronto, University of Toronto Press, 1950). The former work attempts to piece together the Peircean system, while the latter denies the soundness of a systematic interpretation of Peirce's writings.

9Some practical sciences: "pedagogics, gold-beating, etiquette, pidgeon-fancying. . , navigation, telegraphy . . . ," etc. (1.243).

10The basic methodological similarity of Peirce's phaneroscopy to the much more renowned phenomenology of his German contemporary, Edmund Husserl, is of course striking, especially given the fact that Peirce himself often used the term "phenomenology" to refer to his own first order of philosophy (e.g., see 1.186 and 8.295). There is only one reference to Husserl in Peirce's Collected Papers, a passing reference at that, made in 1904, lumping Husserl in with the rest of the "German school of logicians" (8.190). This and the fact that Peirce seemed to have a fairly well-formed notion of his own creation at least as early as 1896 (1.417-421), i.e., four years before the publication of Husserl's Logische Untersuchungen, the work which seems to represent the first major step in the development of the latter's phenomenology, would appear to pretty clearly rule out the possibility of any Husserlian influence on Peirce. (And, of course, Peirce was already playing around in intense earnest with his categories—which would later be clearly identified as the rightful province of phaneroscopy—at least as early as 1867, e.g., see 1.545-559, at which time Husserl was eight years old.)

The younger man, Husserl, certainly would have been in a better position to be influenced by Peirce, but this too seems highly unlikely. For one thing, I have been unable to
find any reference to Peirce in Husserl's writings. However, that he had at least heard of Peirce is clear from the fact that the American's name cropped up in a criticism of Husserl by one Andreas Voight, a criticism which Husserl read. (See p. 86 of Marvin Farber's *The Foundations of Phenomenology*, State University of New York Press, Albany, 1967.) And since Husserl had an interest in the psychological studies of William James, it is likely that he was aware of a connection between Peirce and the doctrine of pragmatism—the doctrine that greatly increased James's international fame and notoriety. Nevertheless, since Peirce's name, upon his withdrawal from academic society, seldom appeared in anything much more impressive than footnotes to the writings of James and John Dewey until the 1930's, and since very little of Peirce's writings dealing with phaneroscopy was available to the public until the publication of the *Collected Papers*, it seems safe to conclude that Husserl's general awareness of Peirce was at best superficial and his knowledge of Peirce's phaneroscopy non-existent.
CHAPTER I

THE PRAGMATIC THEORY OF MEANING

Peirce's Work in Mathematics

It will not be either necessary or appropriate for us to embark on a detailed examination of Peirce's findings in the field of mathematics in order to cull from them the principles that directly affect the formulation of his pragmatic epistemology. Indeed, I believe we shall be able to adequately proceed with our inquiry without delving into the subject matter of the second order of that science—the mathematics of discrete series—and by looking in on the third order—the mathematics of continua—only long enough to note that Peirce defines a continuum as "something whose possibilities of determination no multitude of individuals can exhaust" (6.170). This definition, as we shall see later, is grafted by Peirce onto his notion of generality and, as such, deeply colors the core concepts of his epistemology and goes a long way toward forming the backbone of his doctrine of fallibilism. A very brief stop at the first order of mathematics, the mathematics of logic, appears to me to be warranted however.

Any encounter with Peirce's views on the mathematics of logic brings to the fore a potentially confusing aspect of Peirce's methodology that might smack of ambiguity to the
modern reader. Peirce regards mathematics as a science independent of the rules of logic—"...an appeal in mathematics to logic could only embroil a situation" (4.243) --while he asserts that the very first order of mathematics involves logic. He seeks to resolve this apparent ambiguity by drawing a distinction between the functions of mathematical and philosophical logic:

...mathematics performs its reasonings by a logica utens which it develops for itself, and has no need of any appeal to a logica docens; for no disputes about reasoning arise in mathematics which need to be submitted to the principles of the philosophy of thought for decision (1.417).

As a normative science then—a logica docens—guiding the deportment of mental activity, logic would be a branch of philosophical science and, as such, is no more a prerequisite to the business of mathematics than an understanding of the theory of the formation of vowel sounds is to speech (4.242). Mathematical logic, however, is a branch of a purely hypothetical science and concerns itself only with furnishing fruitful methods for drawing mathematically interesting consequences from abstract hypotheses. The clarity and validity of this distinction aside, Peirce is unequivocal on one point: "Formal logic, however developed, is mathematics" (4.240); and so he sees his own renowned work in the "logic of relatives" to be primarily a mathematical undertaking which generates certain important principles for philosophy to build upon. We shall now focus
our attention upon some of these principles which have a
direct bearing upon phaneroscopy. Certain other of
Peirce's accomplishments in the field of logic (namely, the
classification and analysis of the elementary modes of
inference) are of crucial importance for any inquiry into
his epistemological views, but it seems to me that they fit
most comfortably into that department of logic considered
to be a normative science, and so their inspection will be
deferred until our inquiry fastens itself upon that area of
Peirce's philosophy.

The Logic of Relatives: Monads,

Dyads, and Triads

The whole course of his philosophy influenced by an
early interest in the thought of Kant, Peirce was convinced
that the key to virtually all philosophical problems lay in
a full understanding and appreciation of the nature of the
universal conceptions, or categories, which "reduce the
manifold of sensuous impressions to unity" (1.545). And
like Kant, he sought to find elementary manifestations of
the categories in formal logic:

... in logic, my motive for studying the
algebra of the subject has been the desire
to find out with accuracy what are the
essential ingredients of reasoning in
general and of its principal kinds (8.316).

Though the skill required for such analysis must be of the
finest calibre, the procedure used is itself simple enough--
"One starts by drawing conceptions from logical relations and thence reasoning to their place in the mind."\(^1\) Peirce's extensive researches in the logic of relatives brought him to the conclusion that there are three and only three general types of relations—monads, dyads, and triads—and that all thought is structured on this trichotomy. His alleged discovery was in large measure the result of work with his system of "existential graphs,"\(^2\) but a cursory look at the nature of the trichotomy in terms of propositional forms should shed sufficient light, for our purposes, on Peirce's position.

According to Peirce, in order to determine what sort of relationship is expressed in a given proposition one should consider that proposition voided of its proper nouns, the term "proper noun" being used in a special sense to refer to all words which denote an individual or a set of individuals:

Our European languages are peculiar in their marked differentiation of common nouns from verbs. Proper nouns must exist in all languages; and so must such 'pronouns', or indicative words, as this, that, something, anything. But it is probably true that in the great majority of the tongues of men, distinctive common nouns either do not exist or are exceptional formations. In their meaning as they stand in sentences, and in many comparatively widely-studied languages, common nouns are akin to participles, as being mere inflexions of verbs. If a language has a verb meaning 'is a man', a noun 'man' becomes a superfluity (3.459).
Thus the term "men" in the sentence "Men are cruel" is a proper noun, while in the sentence "All gladiators are men" it is, logically speaking, a part of a verb predicking a property of the individuals designated by the proper noun "gladiators.") The proposition with its proper nouns blanked out Peirce calls a rhema. As an example, the rhema corresponding to the proposition "John is a man" is simply "--- is a man." A rhema with one blank he terms a monad; with two blanks (such as "--- kills ---"), a dyad; with three blanks (such as "--- gives --- to ---"), a triad; etc. Applying the term valency (4.309) in reference to the capacity of a rhema to bring a certain number of proper nouns—logical subjects—into relation, Peirce observes that the rhematic valencies of certain propositions must remain constant if those propositions are to retain their meaning. For example, the bivalent proposition "John and Mary are married" is not equivalent in meaning to the conjunction of the univalent propositions "John is married" and "Mary is married." The upshot of his study then is that genuine dyads are not reducible to monads, nor are genuine triadic relatives reducible to either monadic or dyadic ones. All other polyads, however, may be constructed from combinations of triads:

. . . since. . . (a triad) involves the concept of bringing objects into relation, all higher numbers are given at once, inasmuch as the conception of bringing objects into relation is independent of the number of members of the relationship (3.63).
The consequences which Peirce drew from this basic trichotomy of relations were many, and we shall next examine the influence which it had upon his phaneroscopy. As a foretaste of things to come, however, it is worthwhile to note one observation which he made concerning relations themselves; namely, that all genuine triadic relations involve thought or meaning:

Take, for example, the relation of giving. A gives B to C. This does not consist in A's throwing B away and it's accidentally hitting C.... If that were all, it would not be a genuine triadic relation, but merely one dyadic relation followed by another. There need be no motion of the thing given. Giving is a transfer of the right of property. Now right is a matter of law, and law is a matter of thought and meaning (1.345).

**Phaneroscopy: Firsts, Seconds, and Thirds**

As the broadest of all the positive sciences, for Peirce phaneroscopy is to philosophy much the same as cartography is to geography; for phaneroscopy seeks to map out and analyze the whole of experience, the phaneron, in such a way as to facilitate the efficient operation of the other orders of philosophy. The term "experience" is here used in its most comprehensive sense to include mental phenomena of any and all types, even misapprehensions and fallacious reasonings:
English philosophers have quite commonly used the word *idea* in a sense approaching to that which I give to *phaneron*. But in various ways they have restricted the meaning of it too much to cover my conception (if conception it can be called), besides giving a psychological connotation to their word which I am careful to exclude. The fact that they have the habit of saying that 'there is no such idea' as this or that, in the very same breath in which they describe the phaneron in question, renders their term fatally inapt for my purpose (1.285).\(^5\)

Peirce held the view that there are three "worlds" of experience—the outer, the inner, and the logical worlds\(^6\)—but these are themselves discovered through phaneroscopy, and no one of the three is accorded any special status over the others on purely phaneroscopic grounds. It would appear, then, that phaneroscopy is in a rather unique position among the positive sciences in that it may be indulged in with equal vigor by solipsist and realist alike and will furnish no conclusions that will directly conflict with or strengthen either position. (By "directly" I mean "unaided by conclusions drawn from other positive sciences."). According to Peirce the question of whether the phaneron has any reference or relation to objects which really exist is a matter to be settled by metaphysics, not phaneroscopy.

The first step in Peircean phaneroscopic inquiry is simply the direct observation of all levels of experience. These observations are then compared for the purpose of determining what elements, if any, are common to all of them,
and what relations hold between them. The ultimate goal of the study is to draw up a short list that describes all the broadest categories of phanerons and enumerates the principal subdivisions within these categories (1.286).

Peirce sees two distinct logical operations as necessary to the work of phaneroscopy: prescissive and hypostatic abstraction. The first of these is the process by which one aspect of a conception serves as the object of attention without any regard for certain other aspects. Thus, extension may effectively be prescinded from color. Color, however, cannot be separated out by prescission from extension. It may be discriminated from extension, but that is quite a different matter: "Discrimination has merely to do with the senses of terms, and only draws a distinction in meaning" (1.549). Through hypostatic abstraction ("subjectification") an aspect of an object of thought is, in linguistic terms, converted into a logical subject to which various predicates may be assigned. (For example, by hypostatization we might abstract the notion of happiness from the judgement "The children are happy" and then go on to use "happiness" as a logical subject in an observation such as "Happiness is desired by all people.") It should be fairly clear that hypostatic abstraction is largely parasitic upon prescission inasmuch as a property must first be isolated before it can properly function as ground for predication. With respect to the science of
phaneroscopy, prescission enables one to isolate the elements observed in the phaneron, while hypostatization sets the stage for the shaping of generalizations concerning the necessary properties of those elements.

As has already been pointed out, Peirce felt that the key to the description of the elementary categories of experience lay in his analysis in his "logic of relatives" of the three essential types of relations. Upon entering the field of phaneroscopy, then, one should expect to find in the phaneron elements corresponding to this basic logical trichotomy. The justification for this last claim harks back to his "logic of relatives" discovery that all higher polyads are reducible to triads, the species of relative that involves bringing objects into relation or combination:

The obvious reason. . . (that it is a priori impossible for there to be such an indecomposable element). . . is that that which combines two will by repetition combine any number. Nothing could be simpler; nothing in philosophy is more important (1.298).

And so, the three categories to be encountered in the phaneron should turn out to be: "...those which are simply positive totals, those which involve dependence but not combination (and), those which involve combination" (1.295).

The most fundamental elements that Peirce discerns in the phaneron are those which he eventually subsumes through hypostatic abstraction under the title of "Firstness." This category is characterized by its utter simplicity and
discreteness, its lack of reference or relation to anything outside itself. Firstness of course is a monadic conception, and it is, for Peirce, perhaps best typified in notions of pure quality or feeling. Firstness should not be confused with simple concepts of objects or facts; in the sentence "The building is red," for example, the firstness involved is most clearly manifested in the "redness" which is brought to our attention, not in the fact of the building's being red. Peirce suggests that the best way to come near a conception of pure monadic feeling is to have ". . . in a slumberous condition. . . . a vague, unobjectified, still less unsubjectified, sense of redness, or of salt taste, or of an ache, or of grief or joy, or of a prolonged musical note" (1.303).

Paradoxically, Peirce tells us that the very nature of firstness precludes our ever being able to conceive of it with true clarity or to describe it adequately, for in attempting to do either, we must delimit it and bring it into some manner of relationship with something other than itself:

It precedes all synthesis and differentiation. . . . It cannot be articulately thought: assert it, and it has already lost its characteristic innocence; for assertion always implies a denial of something else. Stop to think of it, and it has flown! . . . Every description of it must be false to it (1.357).

For Peirce, firstness then must be characterized by
possibility, since actualization would involve being brought into a system and systematization entails relation. So likewise it must lie outside the domain of time, for the temporal continuum is itself of the nature of a system. Thus, Peirce goes on to describe firstness as absolute lawlessness (1.407), freedom (6.200), and spontaneity (1.357).

That category of elements which consist in the relation between two firsts, Peirce calls "Secondness" (7.625). This should not be taken to mean that seconds are merely conjunctions of firsts; were they so, they would not be truly elemental. Peirce sees the essence of the relational character of secondness as being embodied in reaction, and so some of his favorite examples of secondness are brute force (1.328), struggle (5.45), and shock (5.613). The idea of striking a match in a darkened room, for instance, is predominated by secondness: both the darkness and the light are chiefly manifestations of firstness since they primarily convey conceptions of qualities, but the flash, the event, the reaction of the light against the darkness, is a case of secondness. Because secondness is relation or reaction between firsts, Peirce observes that seconds cannot be prescinded from firsts, although the latter can be prescinded from seconds (1.353).

Secondness is the category of actuality (1.24), of the realization of a quality through resistance or relation with other qualities. The notion of existence itself is rife
with secondness (1.328), for existence is a form of sustained actualization (although sustainment, as a kind of regularity, involves something else than either firstness or secondness, as will be seen when we discuss Peirce's third category). Peirce says further of existence:

It is numerical identity, which is a dyadic relation of a subject to itself of which nothing but an existent individual is capable. It is to be that numerical identity is not empty verbiage, as the identity of a quality with itself is, but is a positive fact. This is due to the possibility of the individual's assuming different accidents. Throughout all vicissitudes its oppositions to other things remain intact, although they may be accidentally modified; and therein is manifest the positive character of identity (1.461).

Fact, the actualization of possibility is likewise predominated by secondness (1.419); so too is truth (5.121), though less distinctly since it refers to the whole range of facts, those already actualized and those to be actualized throughout the future.

An odd feature of secondness noted by Peirce is that, although it must be conceived of against the backdrop of a temporal continuum, pure secondness is without duration (1.328). Perhaps the best way to clarify the meaning of this claim is to adapt an illustration which Peirce uses in a different context⁹ while making a different point. Let us suppose that a drop of black ink falls upon a blank sheet of white paper. Now no point on the surface of the paper is
neither black nor white, and no point is both black and white. There is obviously a boundary between the blackness and the whiteness; and yet that boundary cannot properly be said to be either black or white, for then it would be either a part of the blackness or a part of the whiteness and would not function as a true boundary. Imagining the sheet of paper to be of infinite length, we may now view the sheet as an analogue of a temporal continuum, with the boundary on the paper representing an event in that continuum—the event being simply the movement of a pencil point from the whiteness of our sheet of paper into the black ink blot upon the paper. The curious thing about this event, however, is that although it takes place in the temporal continuum (and, indeed, can be said to mark off a point in that continuum, just as our ink-paper-boundary marks off points on the paper) it seems to involve no duration in time, for all it consists in is a movement through a boundary that takes up no space. Now, of course, on Peircean terms, to the extent that they fairly represent reactions between the qualities of whiteness and blackness our "boundary" and our "event" are fine instances of Secondness; and our example was intended to show how distinct an instance of secondness can be even though it lacks duration. The obvious question that arises then is this: if secondness is without duration, how is it that we ever become aware of it? Peirce's answer rests upon his analysis of the
last category of the elements of experience--"Thirdness."

A third is that element of the phaneron which brings seconds into relation with firsts (1.66). As such, it cannot be prescinded from seconds and firsts, although seconds can be prescinded from thirds, and firsts of course can be prescinded from both of the other types of elements. Thirdness is mediation (1.530) between firsts and seconds, unifying quality and actuality. Returning to an earlier example to see if we can discern the thirdness present in it, consider the striking of the match in the darkened room. The darkness of the room and the brightness of the flash are both essentially qualities, and so, firsts; the reaction between these qualities is a second. Something is still lacking, however, something that synthesizes the two qualities and the "shock" of the reaction into an intelligible conception of what has transpired. This "something" is thirdness. The term which Peirce originally employed to characterize thirdness was "Representation" (1.553). He later expressed reservations about this characterization being too narrow (1.565), but the term does call attention to a very important aspect of thirdness: its relationship to mind. It will be recalled that Peirce believed that all genuine triadic relatives intrinsically involve thought. The passage cited above (p. 23) to which Peirce drew attention to this property of genuine triads was not quoted in its entirety however; he goes on to say: ". . . though I
have inserted the word 'genuine', yet I do not really think that necessary. I think even degenerate triadic relations involve something like thought" (1.345). In a letter to Lady Victoria Welby, one year\textsuperscript{10} after the writing of those lines, Peirce seems more resolute in his opinion, and his meaning becomes clearer:

But now suppose that giving did consist merely in A's laying down the B which C subsequently picks up. That would be a degenerate form of Thirdness in which the thirdness is extremely appended. In A's putting away B, there is no thirdness. In C's taking B, there is no thirdness. But if you say that these two acts constitute a single operation by virtue of the identity of the B, you transcend the mere brute fact, you introduce a mental element (8.331).

This "external appending" of thirdness occurs by virtue of the specification of the "sameness" of the B through the mental process of representation. And, of course, anything that can be described, thought, or perceived involves, among other things, an implicit recognition of the identity of the object of description, thought, or perception; hence the universality of the element of thirdness in the phaneron. Thirdness, in other words, is needed to facilitate the synthesis of experience into cognition; without the presence of that category unified into the very act of experience, the observer of the phaneron could be likened to a mass of sensory equipment with wires trailing out to nowhere.

As we shall soon see, Peirce's characterization of
thirdness as *representation* is intimately related to his work with his theory of signs which in turn is the ultimate bedrock of his pragmatic criterion of meaning. Nevertheless, Peirce often favored "mediation" as the term most aptly expressing the essence of thirdness, probably because the latter better captures the active character of that category--law. In bringing firsts into relation with seconds, thirdness must operate according to a certain law or pattern, else the phaneron would be nothing more than an incomprehensible garble. A rudimentary case of the activity of law in the phaneron would be that of an *existent individual*. As noted before, the notion of existence is predominated from one point of view by secondness, the category of *reaction* and *actuality*. Yet secondness in itself is foreign to the notion of *duration*, while on the other hand *actuality* must be *sustained*, if only for a moment, for anything to exist. Often using the word "habit" (a term of particular significance for pragmatism) interchangeably with "law," Peirce says that a material object might rightly be described as a "habit of reactions," meaning, in this context, that an existing object is a concretion of qualities (firsts) held together by habit or law (thirdness) in a more or less stable system of reactions (seconds). The question of whether such concretions exist independently of mind is a metaphysical problem, but the phaneroscopist must realize that for there to be any object of conception there
must be the operation of law—regularity—in the phaneron.
As to resolution of the problem raised earlier, i.e., how
we become aware of secondness even though it is without
duration, an example of Peirce's should suffice to explain
his position. In the following passage he describes the
process involved in the cognition of a change in pitch of a
passing locomotive's whistle:

I perceive the whistle... But I
cannot be said to have a sensation of
the change of note. I have a sensation
of the lower note. But the cognition of
the change is of a more intellectual
kind. That I experience rather than per-
ceive. It is the special field of ex-
perience to acquaint us with events,
with changes of perception. Now that
which particularly characterizes sudden
changes of perception is a shock... The long whistle of the approaching
locomotive, however disagreeable it may
be, has set up in me a certain insertia,
so that the sudden lowering of the note
meets with a certain resistance. That
must be the fact; because if there were
no such resistance there could be no
shock when the change of note occurs... But as we are so disposed to yield to
...(the shock)... as soon as we can
detect it, that it is extremely difficult
to convince ourselves that we have
exerted any resistance at all. It may
be said that we hardly know it except
through the axiom that there can be no
force where there is no resistance or
insertia (1.336).

The "insertia" which the initial whistling fostered may be
viewed as being a habit of the mind, a sort of small-scale
law for the mind to operate with. When the tone of the
whistle changes, the listener is forced to adjust his habit
to fit the circumstances. Thus, we become aware of new instances of secondness by means of the modifications they impose upon the thirdness (as habit) operative in our minds.

Two other ideas which Peirce sees as heavily infused with thirdness should be mentioned: generality (1.340) and continuity (1.337). The thirdness of the former is fairly obvious, for generality is merely that which the verbalization of a law describes: 'Given certain conditions, certain results follow'. Continuity is likewise replete with thirdness since, for Peirce, "Continuity is...a special kind of generality" (7.535). One explanation he gives for saying this is:

...the idea of continuity is the idea of homogeneity, or sameness, which is a regularity. On the other hand, just as a continuous line is one which affords room for any multitude of points, no matter how great, so all regularity affords scope for any multitude of variant particulars; so that the idea of continuity is an extension of the idea of regularity. Regularity implies generality. . .(7.535).

We shall see later how critical this identification of continuity with generality proves to be to all the core concepts of Peirce's pragmatic epistemology.

Peirce held the position that the three categories of experience are universal (5.38), that is, that there is no object of conception that upon examination could rightly be found completely empty of some measure of any of the three.
This, of course, would seem to follow from the very natures of the three categories—providing that his delineation of them is correct and assuming that at least one of them is truly universal; for, since firstness and secondness are only intelligible through the mediation of thirdness, and thirdness cannot itself be prescinded from firstness and secondness, every idea which presents itself to the mind must possess elements of all three types. Peirce, however, does mean to be interpreted as saying that all three categories are universal in every respect with regard to their relative roles in the structure of the phaneron. Indeed, he remarks that "...a conception...which was quite universal in every respect would be unrecognizable and impossible" (5.294). The categories are discernible through the fact that different ones are more prominent than the others in different aspects of the phaneron (5.43). They are universally manifested, but not manifested in one universal manner. 13

If, as Peirce claimed, all thought and experience is structured upon the three universal categories which he describes, one might expect to find clear effects of this structuring in all well-executed and systematic intellectual endeavor. Peirce certainly seemed to harbor such an expectation, and his own work is rich with triadic distinctions of almost every conceivable variety. 13 Looking back for a moment, it can be seen that the continual recurrence of
tripartite divisions within his classification of the sciences was not the result of mere coincidence. Looking ahead, we can expect to find more in the way of trichotomous divisions and distinctions; and, for better or worse, we will be confronting the influence of the phaneroscopic categories even in the most seemingly mundane areas of Peirce's epistemology.

The Goal of Normative Science

Peirce's writings concerning the second order of philosophy, normative science, are such as must tend to tantalize any student of his views. They are potentially of great interest to his readers because of the fact that some of his most noted and important work—including the doctrine of pragmatism—falls within the scope of logic, the third sub-order of normative science. Yet in attempting to gain additional insight into that work through an examination of the nature of normative science as normative science, one is hindered by the paucity of Peirce's remarks upon the subject. One of the chief reasons for Peirce's sketchiness on the matter is that it was only relatively late in life that he came to the positions that normative science has a legitimate role in theoretical science, that logic is in fact a normative science, and that esthetics and ethics have any true relevance to philosophy. The vagueness, and sometimes inconsistency, of his pronouncements on normative science
renders an extensive treatment of it here undesirable. I do not believe, however, that discussion of it should be wholly dispensed with since, in my opinion, Peirce grafted the notion of normative science onto his system partly in order to clear away a possible line of objection to his pragmatic theories of meaning and truth. We shall, therefore, take an extremely brief look at Peirce's view of the goal of normative science to try to get a feel for just how it might function in that capacity.  

As might be expected, both the nature and structure of Peirce's normative science bear the stamp of his categories (5.123 and 5.129). It will be recalled that he divided philosophy into phaneroscopy, normative science, and metaphysics. Of this trichotomy, Peirce, perhaps straining a bit, says:

(The). . .division of Philosophy into three grand departments...turns out to be a division according to Firstness, Secondness, and Thirdness, and is thus one of the very numerous phenomena I have met with which confirm this list of categories.

(Phaneroscopy). . .treats of the universal Qualities of Phenomena in their immediate phenomenal character, in themselves as phenomena. It, thus, treats of Phenomena in their Firstness.

Normative Science treats of the laws of the relation of phenomena to ends; that is, it treats of Phenomena in their Secondness. . . .

Metaphysics is the science of Reality. Reality consists in regularity. . . .

Metaphysics. . .treats of phenomena in their Thirdness (5.121-4).
The threefold division within normative science itself likewise displays the influence of the categories, with esthetics pointing to some ultimately admirable quality (a first), ethics indicating what course right action (a second) follows, and logic prescribing the rules for right thought (a third).

Esthetics, as noted earlier, seeks to define the *summum bonum*, that which is good in itself and desirable for itself. Until such a definition is forthcoming the business of ethics cannot properly proceed:

In short, ethics must rest upon a doctrine which, without at all considering what our conduct is to be, divides ideally possible states of things into two classes, those that would be admirable and those that would be unadmirable, and undertakes to define precisely what it is that constitutes the admirableness of an ideal. Its problem is to determine by analysis what it is that one ought deliberately to admire *per se* in itself regardless of what it may lead to and regardless of its bearings upon human conduct. I call that inquiry Esthetics... (5.36).

Similarly, since logic is the science of how we ought to think (5.35) and may loosely be viewed as almost a subsidiary of ethics, the science of how we ought to act, it too must wait upon the conclusions of esthetics.

Peirce's own candidate for the ultimately admirable, or esthetic ideal, is *concrete reasonableness* (5.3). His arguments to this end are far from being logically "tight" in any customary sense, and he realizes this fact:
The only desirable object which is quite satisfactory in itself without any ulterior reason for desiring it, is the reasonable itself. I do not mean to put this forward as a demonstration; because, like all demonstrations about such matters, it would be a mere quibble, a sheaf of fallacies. I maintain simply that it is an experiential truth (8.140).

He does at times (e.g., at 5.313) present an argument along Aristotelian lines that the faculty proper to man's essence is reason and so the esthetic ideal for man must be reasonableness. His other general mode of attack is to consider other goods which philosophers have proposed as being ultimate, such as the subjective goal of pleasure or the objective and material goal of the multiplication of the human race, and find reasons for rejecting them. His reason for rejecting the latter type goal is simple and straightforward: "And if we ought to desire the extended existence of any particular object, it must be because that object has some good character, so that again there is a reason" (8.136), that is, such a goal immediately betrays its own lack of "ultimateness." His objections to the other mentioned type of goal are somewhat more involved, however, and his rejection of such a goal turns out to be potentially significant for pragmatism. Taking up the issue of pleasure as a simple satisfaction of the moment, Peirce argues:

An absolutely simple satisfaction will involve no comparison, no measure, no degree. It will be perfect, if it exists
at all. . . . Then, since this satisfaction would be perfect and immeasurable, and would be, O Consciousness, you say, a good, at how much would you value it? How many years of purgatory would you be willing to endure for the sake of it? Come, speak up. Would you endure five minutes of toothache? For the knowledge that you had, or were about to have, the strange experience, perhaps. But this would be an effect. You must suppose that you were to be utterly ignorant of whether you had, or were about to have any such feeling. . . . I think I hear you murmur that an absolutely simple satisfaction would be an absurdity. Then such satisfaction is no part of the good (1.582).

Granting that the absurdity involved here may be the result of postulating perfect simplicity, Peirce goes on to consider whether pleasure could be the ultimate good if it consisted in the prompt and complete satisfaction of every instinct. Recalling a tale in which a child was cursed with having every wish he could conceive instantly fulfilled, Peirce suggests that, far from being ultimately desirable, the state of affairs resulting from realization of the "good" in question would be quite repugnant, and he goes on to make the following observations:

Now I ask whether in view of this, the mere satisfaction of an impulse can be said to be per se a good, at all. Under certain circumstances, the satisfaction may be good, no doubt; but is it so per se and simpliciter? Here again, we find ourselves contemplating an absurdity. A satisfaction cannot be divorced from its circumstances. It results then that the gratification of an instinct is not per se any part of the good (1.583).
Unfortunately, Peirce's completion of this detailed dissection and rebuttal of the hedonistic *summum bonum* has been lost to posterity. Nevertheless, his rejection of satisfaction as the ultimate good and his substitution of concrete reasonableness in its place could well constitute an attempt to dissociate his own epistemological views from those of William James and place them out of the reach of such criticism as James's pragmatism was rightfully heir to. The standard objection to James's pragmatism was, and is, that it equates truth with the subjective, putative apprehension of truth and, as such, confuses the truth of an individual's belief with the satisfaction which accompanies that belief. (Perhaps the most glaring manifestation of this apparent tendency on the part of James occurs in his famous argument for acceptance of the "religious hypothesis" in his essay "The Will to Believe." ) Peirce's brand of pragmatism, on the other hand, although it bore certain important family resemblances to that of James, was for the most part antithetical to just such subjectivism and Peirce may well have felt it incumbent upon himself to display something in the groundwork of his philosophy that would help explain how, with so many premises in common with Jamesian pragmatists, he could arrive at conclusions so distinctly different from theirs. The unequivocal dismissal of the satisfaction of desire as the final goal of man and the elevation of concrete reasonableness to that status
partially constitutes just such an explanation. Given that concrete reasonableness is the Good for man, and given that ethical prescriptions are determined in light of that Good, then logic—the ethics of thought—describes the manner in which we ought to conduct our intellectual activities so that they will be in accord with concrete reasonableness. Since our beliefs are necessary elements of our intellectual activity (serving as the premisses upon which we perform our inferences which in turn generate further beliefs) they ought not to be determined by the personal satisfaction that attaches to them; rather, they should be products of and promoters of that reasonableness which is both the goal and proper activity of human thought. Thus the standard which should guide the fixation of belief is **objective** in that "rightness" of belief and thought is not contingent upon idiosyncrasies of individuals but upon the extent to which they participate in concrete reasonableness. Since the norm is **concrete** reasonableness, it involves the notion of such participation in its very definition, but this does not render it subjective. For just as right action consists in **acting** right, and the need for **actors** does not diminish the objectivity of that norm, so right thought consists in **thinking** right, and the need for **thinkers** to participate in concrete reasonableness is not at all destructive of that concept's objective and universal normative status. The distinction drawn here between subjectivity and objectivity
is a delicate, perhaps even illusory, one. It is, however, precisely the sort of distinction by which Peirce's views on the nature of meaning, truth, and reality can purport to be highly idealistic—all three terms being defined by Peirce with an explicit recognition of their intimate relationship with human thought—while at the same time he can denounce the subjectivism which depicts the thought of any individual as the standard by which thought itself is to be evaluated.

At later junctures in our study, I will indicate points at which Peirce's notion of concrete reasonableness seems implicitly operative in certain areas of Peirce's pragmatic epistemology. With respect to the matter of William James, suffice it to say that, in making personal utility the criterion by which the appropriateness of beliefs is to be judged, he portrays the norm of an individual's thought as that which is a product of—and so, wholly dependent upon—that thought. Therein lies his subjectivism and one essential difference between Jamesian and Peircean pragmatism.

Peirce's Theory of Signs: Pragmatism

As the normative science which seeks to determine how we ought to think, logic, for Peirce, displays the proper ways in which we should exert self-control (8.240) over our thought processes so that their operations are exercises of concrete
reasonableness. Thus, it is much more than merely the science of how we reason; it is the science of how we ought to reason:

Reasoning is essentially a voluntary act, over which we exercise control. If it were not so, logic would be of no use at all. For logic is, in the main, criticism of reasoning as good or bad. Now it is idle so to criticize an operation which is beyond all control, correction, or improvement (2.144).

Peirce was more than aware, however, that logic must develop its descriptive, as well as its prescriptive, aspects to the fullest; for if reason is to be guided efficiently, the limits of reason must first be sketched out. In other words, the logician should first examine the nature of the reasoning process as it does in fact operate within its own natural limits, before setting about the task of recommending narrower limits within which that process should constrain itself. It was to this first, descriptive phase of logic that much of Peirce's work in philosophy was directed, and it is from this descriptive phase that the pragmatic criterion of meaning derives.

Within the field of descriptive logic Peirce devoted himself to two different—though in fact not wholly distinct—areas of study, and they may best be introduced by citing two interesting claims of his: first, that every thought is of the nature of a sign (5.470), and secondly, that all thought takes the form of inference (5.318). The graphic
justification of these claims must of course consist largely in an exposition of the natures of those signs and inferences which would indicate, if not demonstrate, that all thought is indeed reducible to such elements. And Peirce did in fact back up his claims by developing a relatively sophisticated theory concerning the elementary modes of inference and advancing an extensive and detailed theory of signs. As will eventually become readily apparent, the two theories not too surprisingly overlap—or, at least, cut across each other—to some extent, and that fact is not without significance for our goal of delineating the lines of interrelationship among the core concepts of Peirce's epistemology. In the remainder of this chapter, however, we shall focus upon Peirce's theory of signs (i.e., his work in "Speculative Grammar") and its immediate relationship to the pragmatic criterion of meaning.\(^{18}\)

In one of his earliest published articles, Peirce says:

Consider a state of mind which is a conception. It is a conception by virtue of having a meaning, a logical comprehension; and if it is applicable to any object, it is because that object has the characters contained in the comprehension of this conception. Now the logical comprehension of a thought is usually said to consist of the thoughts contained in it; but thoughts are events, acts of the mind. Two thoughts are two events separated in time, and one cannot literally be contained in the other (5.288).
In this passage, Peirce is pointing to the difficulties involved in attempting to accurately describe the apparent continuity of the thought process, the "association of ideas." We often speak of thoughts as being similar or even identical to each other and of one thought causing or "triggering" another, while on the other hand we would likely concede that any two thoughts are unique, distinct events in time; the consequent problem then is to explain exactly in what ways thoughts are and may be related to each other. Peirce's own attempt at furnishing a satisfactory account of the continuity and consistency of mind is based in his characterization of thoughts as interacting and interdependent signs.

Peirce defines a sign, or representamen, as "something which stands to somebody for something in some respect or capacity" (2.228). According to this definition, then, the sign-relation is triadic, i.e., the rhema of a proposition expressing such a relation would be of the form "---stands for---to---," with the first blank to be filled in by a term designating the sign itself, the second by a term designating the relevant aspect ("respect" or "capacity") of the object to which the sign has reference, and the third by a term designating the interpreter of the sign. Actually the word "interpreter" for the third term in the sign relation is too broad; that which interprets a sign must itself be a thought—and so, a sign—in the mind of the
interpreter. Accordingly, Peirce uses the word "interpre-
tant" (2.228) to refer to this interpreting sign, and it is
the interpretant, strictly speaking, which occupies the
third place in the relation. It can be seen from this
triadic nature of the sign-relation that if something is
properly to serve as a sign it must (1) be in some sort of
relation to an aspect of an object, that aspect constitut-
ing the ground (2.228) of the sign, and (2) relate to an
interpretant sign. We shall now briefly examine the three
basic ways in which, according to Peirce, a sign may relate
to its ground, and then go on to discuss the characteristics
which a sign's interpretant must possess if that sign is to
be meaningful. It should first be noted, however, that
Peirce uses the word "sign" somewhat ambiguously, employing
it to refer both to those things which really are signs
and also to those which are merely possible candidates for
signhood, that is, which meet some but not necessarily all
the conditions requisite to be a true sign. The reader
should, therefore, be aware that until we meet up with
Peirce's full account of the conditions for the meaningful-
ness of signs (and indeed, nothing is a true sign which is
not meaningful) the term "sign" will be used in this
equivocal manner.

Depending upon the type of relation which it bears to
its ground, a sign may, according to Peirce, be an icon,
an index, or a symbol. An icon "is a sign which refers to
the Object that it denotes merely by virtue of characters of its own, and which it possesses, just the same, whether any such Object actually exists" (2.247). Perhaps the clearest case of an iconic sign would be a picture\textsuperscript{20} (2.279) of some object; it is a sign of the object because its resemblance to that object makes it fit to be such. Icons may also take the form of, among other things, images, diagrams, or metaphors (2.277). An image has reference to certain sensible qualities which if possessed by an object render the image fit to serve as an iconic sign of that object.\textsuperscript{21} Diagrams are iconic insofar as they represent the relations obtaining among the parts of some object by exhibiting "analogous relations in their own parts" (2.279). And a metaphor functions as an icon to the extent that that which it represents is understood to be similar in qualities or structures to something else. Peirce even goes so far as to say that every algebraic equation is an icon inasmuch as "it exhibits, by means of the algebraical signs (which are not themselves icons), the relations of the quantities concerned" (2.283). If one word were to sum up the type of relation which an iconic sign bears to its ground, it would be resemblance—-but resemblance in such an unusually extended sense that it admits the above examples. This resemblance, however, whatever its mode of manifestation, is not in the object nor in the sign even though the features which resemble each other exist objectively in each; the resemblance
itself involves the relation of the features in question, and this relation involves in its very conception the notion of an interpreter who (or which) does the actual relating. And these last two notions, i.e., relation and interpreter (or better, interpretation), lie beyond the scope of icons themselves. For Peirce, the essence of an icon consists solely in its possibility of reference to an object in virtue of certain characteristics which it (the icon) possesses; a pure icon then is a pre-eminent participant in Peircean firstness, the category of possibility and quality (2.276). And as a first, an icon lacks reference to anything outside itself: "A pure icon can convey no positive or factual information; for it affords no assurance that there is any such thing... (as may resemble it)... in nature" (4.447). Thus, paradoxically, an icon cannot in itself be a true sign; it lacks a basic prerequisite contained in the definition of "sign"—relation to a ground. As we shall very soon see, however, this does not mean that icons have no relevance to the nature of true signs.

An index is a sign whose relation to an object consists in a connection in fact (1.558). A rash, for instance, may be an index of a certain disease, its existential relation to the disease rendering it so. The real connection which an index has to its object is what makes it fit to point out, or indicate, that object. Pure indices are affected by their objects and depend upon them for their indexical character;
thus, in our example, the nature of the disease determined the nature of the rash which served as its index, and had the former not existed neither would the latter, the rash-index. A distinctive trait of an index is that the notion of resemblance is wholly irrelevant to its indexical features: "A low barometer...is an index of rain" (2.286), but the barometer does not resemble rain even in the broad sense of "resemblance" employed in the characterization of icons. An index, then, is like a pointing finger (2.286), indicating its object but not describing it. Indices though do share a property with icons in that they possess the distinctive characteristics quite regardless of whether anyone attributes to them the relation which they bear to their objects. (On Peirce's terms, that relation is only possible with icons, while it is actual in the case of indices.) The real causal connection which the rash has with the disease (and the barometer with the rain), for example, truly exists whether or not anyone recognizes that connection. It becomes apparent then that for Peirce indices are intimately involved with secondness (1.558), the category of actuality and dyadic relation, and it is precisely their extreme saturation in that category that renders them incapable of serving as true signs until another ingredient is added. For pure indices lack generality, a property which is essential for intelligibility and which is primarily an affair of thirdness. Peirce
accordingly distinguishes between pure and "degenerate" indices, the latter related to their objects not through any existential connection, but referentially (2.283). Demonstrative pronouns are perhaps the best examples of degenerate indices; they serve linguistically to "point out" their objects without actually describing any qualities which those objects possess. In so doing, however, they expose their own "degeneracy," that is, their dependence upon some element other than the secondness which characterizes pure indices:

That a word cannot in strictness of speech be an index is evident from this, that a word is general—it occurs often, and every time it occurs, it is the same word, and if it has any meaning as a word, it has the same meaning every time it occurs; while an index is essentially an affair of here and now. . . (4.56).

Hence, indices, in order to function as true signs, require a generality which they themselves do not possess. This generality is to be provided through the mediation of symbols.

Symbols are signs whose representational relation to their objects is determined by "a habit, disposition, or other effective general rule" (4.448). Prime specimens of symbols are ordinary words. A word is not associated with its object because of any qualitative resemblance to the object, nor because of any physical relationship to that object; its association with its ground is based simply on
convention (2.307), and it is just the realization of such convention that makes a symbol a genuine sign. Peirce describes his findings on this matter fairly straightforwardly in the following passage:

Take, for example, the word "man." These three letters are not in the least like a man; nor is the sound with which they are associated. Neither is the word existentially connected with any man as an index. It cannot be so, since the word is not an existence at all. The word does not consist of three films of ink. If the word "man" occurs hundreds of times in a book of which myriads of copies are printed, all those millions of triplets of patches of ink are embodiment of one and the same word. I call each of those embodiments a replica\textsuperscript{23} of the symbol. This shows that the word is not a thing. What is its nature? It consists in the really working general rule that three such patches seen by a person who knows English will effect his conduct and thoughts according to a rule. Thus the mode of being of the symbol is different from that of the icon and from that of the index (4.447).

Pure icons and pure indices are fit to be signs inasmuch as they possess characters which render them especially likely to be associated with their objects by some interpreter; fitness for signhood, however, is not enough to make something actually function as a sign. A genuine sign stands for something to somebody, and unless some mind actually does associate the sign with its object it cannot, on Peirce's terms, rightly be said that the sign really stands for anything.\textsuperscript{24} It must after all be remembered that the sign-relation is triadic in nature and that according to Peirce
triads are not reducible to lower term relations. We can meaningfully focus our attention upon a part of a triadic relation, but to do so without consideration of the other parts is to disregard the essential character of that relation. In the case at hand, we should bear in mind that in talking about the reference of a sign to its ground we must not lose sight of the other segment of the sign-triad—the relationship between sign and interpreter. The limitation of pure icons and pure indices then is that, qua icons and indices, they realize their full defining characteristics irrespective of any relation to an interpreter and, as such, fail to meet all the requirements for signhood. In short, an uninterpreted sign is no sign at all. Once the potential sign is referred to a ground by the mind of an interpreter, however, it acquires the full status of signhood. At the same time, it also acquires a symbolic aspect, for the interpretation of a sign by an interpreter depends upon a habit of association which determines his reaction to that sign. Thus, by definition, all genuine signs must have a symbolic aspect.

It should be surmisable from the above remarks that Peirce sees as a distinctive element in the nature of symbols their participation in thirdness, the category of generality and habit (8.269). Such a characterization of symbols suggests an important feature of their constitution; just as thirdness, the category of representation (and so,
intelligibility), is empty without the participation of firstness and secondness, so too it is to be expected that symbols, as thirds, require corresponding seconds and firsts in order to fulfill their proper functions as genuine signs. The relevant firsts and thirds in this context are of course icons and indices, and a would-be symbol which did not involve both of these would not really serve as a sign (or, for that matter, as a symbol). Of an ordinary word-symbol such as "give," or "bird," or "marriage," Peirce says:

It is applicable to whatever may be found to realize the idea connected with the word; it does not, in itself, identify those things. It does not show us a bird, nor enact before our eyes a giving or a marriage, but supposes that we are able to imagine those things, and have associated the word with them (2.298).

This association is indispensable for the meaningfulness of a symbol and is effected through the presence of iconic and indexical aspects adherent to that symbol. The word "bird" for example is symbolic in that it signifies a type of object by virtue of its conventional usage. Were that word completely devoid of iconic significance, however, it would be largely meaningless, for it would trigger in the mind no conception of the qualities which make up that object. Similarly, indexical significance is also necessary because we need to have some idea of what the word determinately "points out," or refers to; and it is just the indexical aspect of a word which delimits the range of
that word, thereby preventing its universal applicability
and consequent uselessness. (Thus, Peirce's distinction
between the iconic significance and indexical significance
of a word-sign can be seen to bear a striking resemblance
to Frege's distinction between the sense and reference of a
of a sign.)26 Some words are more predominantly iconic, or
indexical, or symbolic in character than others, but to
construe them as being wholly divorced from their two less
prominent aspects would be, on Peirce's terms, to view them
as being something less than genuine signs.

Peirce's characterization of the iconic, indexical, and
symbolic aspects of true signs corresponds to (indeed, is
virtually identical with) his categorization of three types
of meaning which a sign possesses: internal meaning,
external meaning, and principal meaning:

As for the 'meaning', logicians have
recognized since Abelard's day and
earlier that there is one thing which any
sign, external or internal, stands for,
and another thing which it signifies;
its denoted breadth. . .(its external
meaning), its 'connoted' depth. . . (its
internal meaning). . . . There is,
however, a third totally different
order of signs. . . . Such signs may
have little or much internal meaning
and external meaning but they have a third
kind of meaning which consists in the
character of the interpretant signs which
they determine. This is their principal
meaning (8.119).

What is especially significant about the above passage is
that Peirce here explicitly notes that the third order of
signs (which, of course, are symbols) possess their principal meaning by virtue of their relationship to interpretant signs. And so, to get a better picture of just what this "principal" meaning of sign-symbols consists in, we need now to adjust the emphasis of our discussion. For until now we have concerned ourselves mainly with the relations of signs to their objects, or more precisely, to their grounds; and as it turned out, only symbols qualified as genuine signs because it is only they which are interpreted as signs, interpretation being a necessary condition for signhood. Now, therefore, the investigation must proceed toward the disclosure of the necessary conditions for the interpretation of signs; that is, we must find out just what shape, according to Peirce, the reaction of an interpreter must take if a sign is to be meaningful to that interpreter. This will involve a closer look at the other "half" of the sign-triad—the relation of sign to interpretant.

Interpretants—"the proper significate effects" of signs (5.475)—are divided by Peirce into three general classes. First, there are emotional interpretants: "The first proper significate of a sign is a feeling produced by it" (5.475). This feeling may amount to nothing more intense than a sense of recognition. It may also turn out that the feeling is the only interpretant of the sign, as in the case of a performance of a piece of music, where the music serves as a
sign "intended to convey the composer's musical ideas; but these usually consist merely in a state of feelings" (5.475). If there is any further effect of the sign, however—that is, if there is another type of interpretant involved—this new effect will itself be produced through the mediation of the emotional interpretant, and:

.. such further effect will always involve an effort. I call it the energetic interpretant. The effort may be a muscular one, as it is in the case of the command to ground arms; but it is much more usually an exertion upon the Inner World, a mental effort. It can never be the meaning of an intellectual concept, since it is a single act, while such a concept is of a general nature. But what further kind of effect can there be? (5.475).

Peirce's claim that the meaning of a concept (and for that matter, the meaning of any sign)\(^{27}\) must be general is a corollary from his phaneroscopy, for without the intervention of thirdness, the category of generality, nothing is intelligible to the mind.\(^{28}\) Assuming this to be true then, Peirce attempts to answer his own question, 'What further kind of significate effect, beyond the emotional and energetic interpretants, can a sign have?', by marshalling forth the logical interpretant (5.476), the intellectual effect to which a sign gives rise. If the meaning of a concept must be general, so too must be the intellectual effect which constitutes the meaning of a sign. Considering four types of phenomena—concepts, desires, expectations, and
habits—in order to determine which, if any, meet the necessary condition of generality, Peirce reasons thusly:

Now it is no explanation of the nature of the logical interpretant (which, we already know, is a concept) to say that it is a concept. This objection applies also to desire and expectation, as explanations of the same interpretant; since neither of these is general otherwise than through connection with a concept. Besides, as to desire, it would be easy to show...that the logical interpretant is an effect of the energetic interpretant, in the sense in which the latter is an effect of the emotional interpretant. Desire, however, is cause, not effect, of effort...Therefore, there remains only habit, as the essence of the logical interpretant (5.486).

For Peirce, only habits (aside from concepts) possess the generality which is the essential constituent of meaning, and it is habit therefore which is to be regarded as the intellectual effect, or logical interpretant, of any meaningful sign. Besides being the only mental phenomenon of the group mentioned that survives the test of inherent generality (except of course for concepts themselves), there is also another reason why habit would be the natural choice as the logical interpretant. Assuming that the emotional-energetic-logical interpretant trichotomy is a sound one, it is readily apparent that these three types of interpretants are cases, respectively, of Peircean firstness, secondness, and thirdness. Seconds, it will be recalled, can be known only through their effects upon habits of the mind. As a second then, any energetic interpretants only
cognizable effect would be that which it has upon habit; and since the logical interpretant is also an effect of the energetic interpretant, for Peirce the logical interpretant and the habit whose character is determined by the energetic interpretant must be one and the same.

In considering the nature of the logical interpretant of a sign, it should be pointed out that Peirce states that there may be more than one such interpretant for any given sign. The first logical interpretants take the form of mental experiments in which are reviewed, by means of conjecture, the possible shapes which new habits may take:

We imagine ourselves in various situations and animated by various motives; and we proceed to trace out the alternative lines of conduct which the conjectures would leave open to us. We are, moreover, led, by the same inward activity, to remark different ways in which our conjectures could be slightly modified (5.481).

Eventually, if the sign which gave rise to all this conjecture is to have any fixity of meaning, the mind will finally settle upon some relatively stable habit, or habits, in response to that sign. This last habit, or set of habits, Peirce terms the ultimate (5.477)—or final—logical interpretant of the sign, and it is this which constitutes the principal meaning of that sign.

It might be well at this point to organize some of Peirce's conclusions through the following brief (and perhaps somewhat crude) description of the way the sign-process
works. A man is confronted with a sign, \( S \), which, if it is to be meaningful for him, must be a symbol with iconic and indexical aspects. \( S \) triggers in him a certain feeling (however tepid), an emotional interpretant. This emotional interpretant in turn brings about an active volitional response, the energetic interpretant. The consequent effect of that response upon his intellect is a change from whatever habit his mind was operating with immediately preceding the appearance of \( S \), to another habit. (There may be—especially if \( S \) is a sign never or seldom previously encountered—be a span of time during which different possible habits, the first logical interpretants, are appraised.) The habit which is settled upon after the intervention of the energetic interpretant is the ultimate logical interpretant—and principal meaning—of \( S \) for the man in question.

If it is granted that a concept is nothing more than a particular type of sign and that the intellectual meaning of a sign rests with the habits of thought that it determines, then, according to Peirce, the articulation of the meaning of a concept will consist in a description of the habits relevant to it:

The most perfect account of a concept that words can convey will consist in a description of the habit which that concept is calculated to produce. But how otherwise can a habit be described than by a description of the kind of action to which it gives rise, with the
specification of the condition and of the motive? (5.491).

Thus, in describing another person's habits, we might say something of the form "Under such-and-such types of conditions, to achieve such-and-such personal aims, he/she acts in such-and-such a manner" (understanding the term "act" to include possible mental activity). And in trying to give a verbal formulation of our own consciously developed and maintained habits, we might arrive at something like "When such-and-such conditions obtain, act (or think) in this way in order to achieve such-and-such ends."

At this point a momentary digression is in order. In preceding pages of this study, when referring to Peirce's notion of habit, I have blithely skirted over the distinction to be drawn between habits of mind and habits of physical response. Peirce himself frequently does such skirting, particularly in discussions of his theory of meaning, speaking at times in heavily mentalistic terms of activities and habits in the "inner world" and then going on to describe, with no explicit transition or translation, parallel or corresponding habits of physical behavior. What to the modern reader, conditioned by the influence of behaviorism, might appear to be loose (if not at times meaningless) descriptions by Peirce of habit-phenomena in reality conceal an underlying quasi-behaviorist tendency on Peirce's part, however. For, while Peirce found mentalistic descriptions to be both meaningful and useful and himself
employed them freely, he was behaviorist enough to feel that most such descriptions were ultimately reducible to descriptions of physical response. In the same general passage from which the preceding quotation was lifted, for example, Peirce goes on to say:

If we now revert to the psychological assumption\(^3\) originally made, we shall see that it is already largely eliminated by the consideration that habit is by no means exclusively a mental fact. Empirically, we find that some plants take habits. The stream of water that wears a bed for itself is forming a habit. Every ditcher so thinks of it. Turning to the rational side of the question, the excellent current definition of habit, due, I suppose, to some physiologist... says not one word about the mind. Why should it, when habits in themselves are entirely unconscious, though feelings may be symptoms of them, and when consciousness alone—i.e., feeling—is the only distinctive attribute of mind?

What further is needed to clear the sign of its mental associations is furnished by generalizations too facile to arrest attention here, since nothing but feeling is exclusively mental (5.492).

Whether mentalistic or behavioristic, however, descriptions of habits may be seen, on Peirce's terms, to take the form of conditionals referring to possible future events and activities. And to say that a statement of all such conditionals entailed by a concept-sign would serve as an exhaustive account of the meaning of that concept is, in effect, to enunciate the pragmatic criterion of meaning:

The entire intellectual purport of any symbol consists in the total of all
general modes of rational conduct which, conditionally upon all the possible different circumstances and desires, would ensue upon the acceptance of the symbol (5.438).

Peirce's earliest rendition of the maxim ("Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then our conception of these effects is the whole of our conception of the object.") is perhaps a bit more clearly expressed, but its lack of explicit reference to the conditionality surrounding the "conceived effects" of the object of conception caused Peirce to slip into making certain claims concerning meaning and truth which he eventually came to recant. In later formulations of the principle, Peirce sometimes speaks of the meaning of a concept as residing with the sum total of the practical consequences which follow necessarily from its predication. It should be noted here then that the term "consequence" is used in a special sense by Peirce to denote

. . . the relation between one general description of event, A, an antecedent, and another general description of event, C, a consequent, the relation consisting in the fact that whenever A is realized, C will be realized (7.107).

Thus, in the present context, the practical consequences which are to be construed as constituting the meaning of a concept-sign may be seen to be simply the habits of action which "would ensue upon the acceptance" of that concept-sign,
and such consequences are to be described through the use of conditional, or hypothetical, propositions.

Peirce's claim that all signs which possess intellectual meaning will have that meaning effectively exposed through application of the pragmatic maxim may perhaps seem ambiguous and unwieldy inasmuch as it draws no distinction between certain different types of signs whose meanings require elucidation. On the psychological level, for instance, we distinguish between judgments and the elemental, non-judicative concepts which serve as the mental tools from which judgments are fashioned. As a case in point, there seems to be quite a difference between the general notion of redness and the judgment that a certain object is red. Correspondingly, on the verbal level there appears to be an important distinction to be made between terms and propositions, and so possible reason to believe that there should be somewhat different criteria of meaning for each. The shape of Peirce's response to this tentative objection would, I believe, be determined by his characterization of thoughts as signs; for, if both thought and language consist in the interaction of signs, and if there are certain universal characteristics which meaningful signs must possess, then it is reasonable to suppose that an answer to the objection by citing considerations relevant to language—signs would also suffice to settle any qualms about the meaning of such mentalistic entities as judgments
and "non-judicative" concepts. After all, "It should never be forgotten that our thinking is carried on as a dialogue, and though mostly in a lesser degree, is subject to almost every imperfection of language" (5.506). And the reply to be offered on linguistic grounds would consist in the observation that terms and propositions, insofar as they are meaningful, are elliptical forms of arguments:

There is but one primary and fundamental logical relation, that of illation, expressed by ergo. A proposition, for me, is but an argumentation divested of the assertoriness of its premiss and conclusion. This makes every proposition a conditional proposition at bottom. In like manner a "term," or class name, is for me nothing but a proposition with its indices or subjects left blank, or indefinite. The common noun happens to have a very distinctive character in the Indo-European languages. In most other tongues it is not sharply discriminated from a verb or particle. "Man," if it can be said to mean anything by itself, means "what I am thinking of is a man." This doctrine, which is in harmony with the . . . theory of signs, gives a great unity to logic . . . (3.440).

Thus the doubts raised at the outset of this paragraph are undercut by Peirce's virtual equation of term and proposition, and the pragmatic criterion of meaning should be as adequate in dealing with the one as with the other.

If some of the trappings and underpinnings of the pragmatic criterion of meaning seem at times a bit abstruse, at least the man of its application is relatively straightforward: "Let us ask what we mean by calling a thing hard.
Evidently that it will not be scratched by many other substances" (5.403). That is, to say of a thing that it is hard is to mean that if it is rubbed against other substances, few of those substances will scratch it. The last fourteen words of this last sentence describe a practical consequence, the acceptance of which constitutes a habit for action. The term "practical" appears to function for Peirce simply, but vitally, to emphasize the fact that all such descriptions must be conceivably verifiable; that is, they must refer to some experiential situation in which the truth of the consequent of the description could be confirmed or refuted by the obtaining of the conditions specified in the antecedent. 35 (The Peircean notion of verifiability will be examined in some depth in Chapters III, IV, and V of this study.) Peirce's idea of practicality is an effect of his empiricist leanings and is one of the two points at which his pragmatic theory of meaning "touches ground." As signs, all signs must possess at least a modicum of iconic significance in that they must be related to their objects according to some qualities which those objects possess, qualities which are given only in perceptual judgment. 36 And these sign-concepts ultimately manifest their meaningfulness by effects upon our habits, habits being nothing more than rules for action (either physical or mental). Stated somewhat more eloquently:
The elements of every concept enter into logical thought at the gate of perception and make their exit at the gate of purposive action; and whatever cannot show its passports at both those gates is to be arrested as unauthorized by reason (5.212).

In this chapter we have concerned ourselves primarily with tracing in rough (but, I think, for our purposes adequate) detail Peirce's derivation of the pragmatic criterion of meaning. In so doing, we have happened upon a fact that is, I believe, of some significance to the central thesis of this paper (that thesis, simply stated, being that Peirce's theories of meaning and truth are logically bound together closely in an intricate and internally consistent whole which constitutes a distinctive and multi-faceted epistemological perspective). The fact to which I allude is that pragmatism, even when viewed in a restricted sense as being nothing more than a criterion of meaning, purports to explicate the meaning of terms, concepts, and propositions by construing these entities as functioning as (or functioning in) truth-claims and in turn specifying the conditions under which such truth-claims would be verified. In the following version of the pragmatic criterion of meaning, Peirce touches upon the interdependence of the notions of the meaning and truth of a "conception":

In order to ascertain the meaning of an intellectual conception one should consider what practical consequences might conceivably result by necessity from the
truth of that conception; and the sum of these consequences will constitute the entire meaning of the conception (5.9).

In referring to the "necessity" with which practical consequences follow from the truth of a conception Peirce is merely indicating that such consequences are always intrinsic to the meaning of a conception and, in principle at least, necessarily educible when delineating that conception's meaning. These consequences, in turn, relate back to the matter of the truth of the conception by virtue of comprising the experiential conditions which would establish that conception as indeed being true.

It would seem that such observations should cast grave doubts upon the propriety of the view that "Peirce's Pragmatism has no direct bearing on the question of truth or falsity," but there are several other levels of consideration that need to be dealt with in order to conclusively refute that view and, more importantly, display fairly comprehensively the relationships and harmony which exist between the Peircean theories of meaning and truth. In our next chapter we will take our last major step along the road suggested by Peirce's "order of classification of sciences" and will, as previously indicated, examine some of his work within the field of Critic, namely, his theory concerning the elementary modes of inference. If my earlier remark that the latter theory and the theory of signs "overlap or, at least, cut across each other" was correct, we
should be able to expect pragmatism, in some guise or other, to rear its head again at some point within the discussion of the modes of inference. And since the modes of inference constitute for Peirce methods for arriving at truth, we should also be able to discover some considerations which bear directly upon the central theme of this study.
NOTES TO CHAPTER I

1Quoted by Philip Wiener in Evolution and the Founders of Pragmatism (Cambridge, Harvard University Press, 1949), from an unpublished manuscript in the Harvard University Archives.


3Or, of course, monadic relative, dyadic relative, etc., though sometimes (e.g., 4.438) Peirce reserves the term "relative" for rhemas of more than one blank.

4Peirce describes phaneroscopy as "the most primal of all the positive sciences" (5.39), defining "positive science" as "an inquiry which seeks for positive knowledge; that is, for such knowledge as may conveniently be expressed in a categorical proposition" (Ibid.). In 5.40, he explains why he does not view mathematics as fitting this definition.

5Nevertheless, Peirce does at times call the science in question "Ideoscopy" (e.g., in 8.328). He originally used the more common term "Phenomenology" but rejected it because of its Hegelian associations.

6A distinction he credits to Francis E. Abbott, author of a book called Scientific Theism (8.298).

7A term derived from the praecisio of Duns Scotus (1.549n). Peirce explains his own peculiar choice of the term prescission over that of precision in 5.449.

8Peirce used the terms Firstness, Secondness, and Thirdness in reference to his categories in order to indicate their association with mathematical relations (8.328) and, apparently, to keep them divorced from some of the time-worn
philosophical connotations attaching to more traditional
terms (2.222).

9 At 4.127 in the exposition of his "Logic of Quantity"
(4.85-152).

10 1904.

11 In 5.93-101, when arguing for his own version of
scholastic realism ("...that Thirdness is operative in
Nature"), Peirce seems to concede that the term
"representation," as the chosen characterization of Third-
ness, could be construed as having nominalistic impli-
cations.

12 The reader may quite understandably be inclined to
feel that metaphysical notions--possibility, actuality,
chance, existence, etc.---have corrupted this little dis-
cussion of phaneroscopy already. It must be borne in mind,
however, that "the phaneron" encompasses all conceptions,
metaphysical or otherwise, and that, on Peircean terms, as
long as it draws no principles from another positive science
phaneroscopy is well within its legitimate grounds. However,
later in our study we will have occasion to note the
apparent influence of metaphysical principles upon Peirce's
pragmatic epistemology.

13 In his Peirce and Pragmatism (op. cit., p. 205), W. B.
Gallie contends that Peirce's categories are, on Peirce's
own terms, meaningless:

Broadly, Pragmatism tells us that a state-
ment has a meaning--of the kind that its
outward form suggests--if, and only if, some
distinctive consequences of an experimental
character can be deduced from it. Quite
evidently, however, if Peirce's categories
are universal in the sense he intends, no
distinctive consequence can ever result from
the assertion that they apply to this or
that actual or conceivable state of affairs.
Their all-pervasiveness inevitably spells
their vacuity--their lack of informative
value; and what other value--at any rate of
the intellectual kind--can a systematic
body of categorical statements possibly
possess?"

Not being sure of the sense Gallie intends with the words
"in the sense he intends," I'm not sure how just this
critique really is. As my remarks on p. 30 were aimed at
showing, Peirce appreciated the problem that ascribing
absolute universality to any concept opened up; and it seems
to me that the 'modified absolute universality' of his
categories is enough to at least save them from the garbage
bin of literal nonsense. As for the categories possibly
being unable to survive a steady-handed application of the
pragmatic criterion of meaning, I think that perhaps Gallie
has too rigid a notion of the 'toughness' of that criterion.
Later in this paper we shall see how, for reasons very
important to Peirce and very significant for his episte-
mology, the pragmatic maxim mellowed with age during
Peirce's career.

As late as 1898 (when he was 59) he said, "Ethics... even if not a positively dangerous study, as it sometimes proves, is as useless a science as can be conceived" (1.667).

For a fairly detailed article which traces Peirce's fluctuating views on the subject, see "Peirce's Analysis of Normative Science" by Vincent J. Potter in Transactions of the Charles S. Peirce Society, vol. II, no. 1, Spring 1966, pp. 5-32.

In a note to the chapter in the Collected Papers from which the two quotations on p. 41 were drawn, the editors point out that five pages of the original manuscript are missing. The five page gap occurs one paragraph after paragraph 1.583, from which the second quotation was taken. In that one remaining paragraph Peirce does go on to initiate a refutation of one more variety of hedonistic 'good': the satisfaction of future instinctive desires. It seems to me, however, that he has not yet fully developed his argument by the point at which the gap appears.

See particularly pages 139 and 179.

The treatment of the theory of signs in this chapter is necessarily compact. For an excellent in-depth study, see John J. Fitzgerald's Peirce's Theory of Signs as the Foundation of His Pragmatism (The Hague, Mouton, 1966).

As an example of the latter, if a monkey playing with a piece of chalk were by chance to write the word 'zebra' on the floor of his cage and then wipe it away before any literate being had observed it, that inscription would not have been a true sign having reference to zebras, because,
although it had possessed a certain fitness to serve as such, no one had so interpreted it.

20 That is, a picture that is not a photograph. Photographs, for Peirce, are more clearly indices because of their casual dependence on their objects.

21 The phrase "has reference to" is of some importance, for although the key word in characterizing icons is "resemblance" (see remainder of above paragraph) Peirce is a staunch opponent of the early empiricist view that images are actual copies of objects (5.299). He says, for example, that when we have an image of a color, "We carry away absolutely nothing of the color except the consciousness that we could recognize it" (5.300).

22 Save, of course, for onomatopoeic words.

23 A term that is a forerunner of "token" in Peirce's type-token distinction (See, e.g., 4.537).

24 I do not of course mean by this that Peirce would say that a sign has to be communicated from one person to another person to constitute a genuine sign. For example, if a man scratches the word "unsafe" on the side of his car, but that car is burned beyond recognition before anyone else has seen the word-scratch, the latter constitutes a genuine sign on Peircean terms by virtue of its interpretation in the mind of its creator.

25 Peirce's insistence on the presence of iconic and indexical aspects in language should not be construed as meaning that words "resemble" or are "causally connected" with their objects. Rather, as I indicate on the next page of the text, it is his idiosyncratic way of marking off a sense/reference (or connotation/denotation, or intension/extension) type distinction.


27 Even proper names are viewed by Peirce as being essentially symbolic (and so, general) in character. He describes the process by which they acquire their generality as follows:
A proper name, when one meets with it for the first time, is existentially connected with some percept or other equivalent individual knowledge of the individual it names. It is then, and then only, a genuine Index. The next time one meets with it, one regards it as an Icon of that Index. The habitual acquaintance with it having been acquired, it becomes a Symbol whose Interpretant represents it as an Icon of an Index of the Individual named (2.329).

28 See pp. 25–29 of this study.

29 As in 5.491, Peirce also, however, employs the term "final interpretant" to refer not to what the intellectual effect of a sign turns out to be, but what it should ideally be, e.g., in 8.184).

30 Thus, in one of the many and varied enunciations of the "pragmatic maxim," Peirce says:

Pragmatism is the principle that every theoretical judgment expressible in a sentence in the indicative mood is a confused form of thought whose only meaning, if it has any, lies in its tendency to enforce a corresponding practical maxim expressible as a conditional sentence having its apodosis in the imperative mood (5.18).

31 The "psychological assumption" Peirce is referring to appears to be that of the existence of modifications of consciousness which at the mentalistic level constitute the nature of logical interpretants (See 5.485).

32 As in 5.2, 5.9, and 8.191.

33 A master logician himself steeped in the history of logic, it is not surprising that Peirce's use of the term "consequence" was apparently influenced by the medieval notion of consequentiae. In their classic study The Development of Logic (London, Oxford at the Clarendon Press, 1962), p. 215, William and Martha Kneale describe an early meaning-change involving that notion:

In Abelard's usage the word consequentia does not mean, as it did for Boethius, the
way in which one proposition follows from another. When he wishes to talk of that relation, he uses instead the word *consecutio*, because he regards *consequentia* as reserved for the sense of 'conditional proposition'.

34 See also 3.175 and 4.3 for descriptions of this equation.

35 The closest thing I have been able to find of a definition by Peirce of the term "practical" is in a letter to F. S. C. Schiller: "By 'practical' I mean apt to affect conduct. . ." (8.322).

36 Peirce criticizes Leibniz's method of abstract definition thus:

This great and singular genius was as remarkable for what he failed to see as for what he saw. That a piece of mechanism could not work perpetually without being fed with power in some form, was a thing perfectly apparent to him; yet he did not understand that the machinery of the mind can only transform knowledge, but never originate it, unless it be fed with facts of observation (5.392).
CHAPTER II

MEANING AND TRUTH:

THE LOGIC OF ABDUCTION

The Modes of Inference

In maintaining that "every exercise of the mind consists in inference" (5.318), Peirce was making a much more significant and specific claim than that, for instance, the mind's passage from one thought to another is governed by the traditional 'laws of the association of ideas'. He was instead propounding the rather more provocative view that "all our reasonings conform to the laws of logic" (5.192). And with the expression "laws of logic," Peirce was referring to certain very definite, schematizable logical patterns somewhat similar in structure to the syllogistic figures of Aristotelian logic. Of course, the first question that might occur to a person sceptical of Peirce's broad claim would be to ask how fallacious reasonings could be said to exhibit the characteristics of such "laws of logic" if the latter are properly to be construed as principles that confer validity upon the reasonings which they regulate. Peirce's handling of this question proceeds along two lines. First of all, he defines validity in terms of an argument's or reasoning's adherence to an inferential method that is more
or less successful in generating true conclusions, and, consequently, he cautions against equating validity in general with deductive validity:

Every argument or inference professes to conform to a general method or type of reasoning, which method, it is held, has one kind of virtue or another in producing truth. In order to be valid the argument or inference must really pursue the method it professes to pursue, and furthermore, that method must have the kind of truth-producing virtue which it is supposed to have. . . . Validity must not be confounded with strength. For an argument may be perfectly valid and yet excessively weak (2.780).

Peirce concedes that in the case of deduction the notions of validity and strength do indeed coincide, but he maintains that this is merely a peculiarity of deductive inference rather than of inference in general:

An argument is valid if it possesses the sort of strength that it professes and tends toward the establishment of the conclusion in the way in which it pretends to do this. . . . An argument is none the less logical for being weak, provided it does not pretend to a strength that it does not possess. . . . An argument is fallacious only so far as it is mistakenly, though not illogically, inferred to have professed what it did not perform (5.192).

Working then with this broadened notion of validity, the second phase of Peirce's answer to the question of whether fallacious reasonings constitute counter-examples to the claim that "all our reasonings conform to the laws of logic" is to declare that all such faulty inferences fall into one or more of four particular classes and that all members of
each class can be shown to be merely irregular instances of valid inference. The four classes of fallacious inference are:

1. Those whose premisses are false;  
2. Those which have some little force, though only a little;  
3. Those which result from confusion of one proposition with another;  
4. Those which result from the indistinct apprehension, wrong application, or falsity, of a rule of inference (5.282).

With respect to the first variety, Peirce notes that the mere falsity of the premisses is no real reflection upon the quality of the inference involved, and therefore, if the inference in question is actually fallacious, it must fall into one of the three other classes described. Of the second class of alleged fallacy, Peirce remarks that such inferences are not genuinely invalid, because they would constitute legitimate "probable arguments," however weak, and as such (given the broad definition of "validity" with which we are operating) should be construed as instances of valid inference. Regarding the third class, Peirce says:

This confusion. . .(of one proposition with another). . .must be owing to a resemblance between the two propositions; that is to say, the person reasoning, seeing that one proposition has some of the characters which belong to the other, concludes that it has all the essential characters of the other, and is equivalent to it. Now this is a hypothetic inference, which though it may be weak, and though its conclusion happens to be false, belongs to the type of valid inference; and therefore, as the modus of the fallacy lies in this confusion, the procedure of the mind in these
fallacies of the third class conforms to the formula of valid inference (5.282).

And if an inference falls into the fourth class:

. . . it either results from wrongly applying or misapprehending a rule of inference, and so is a fallacy of confusion, or it results from adopting a wrong rule of inference. In this latter case, this rule is in fact taken as a premiss, and therefore the false conclusion is owing merely to the falsity of a premiss (Ibid.).

And so, from these observations, Peirce concludes:

In every fallacy, therefore, possible to the mind of man, the procedure of the mind conforms to the formula of valid inference (Ibid.).

The key to this destructive dissection of "fallacious" inference is, of course, the rather liberal Peircean notion of validity which admits as valid (i.e., as bona-fide exemplifications of the "laws of logic") such arguments and inferences as were largely ignored or disdained by the scholars of traditional, syllogistic logic. To better flesh out this motion of validity and, more to the point, lay the groundwork for further insights into Peirce's pragmatic epistemology, we will briefly examine Peirce's theory regarding the forms, or modes, which valid inference--and so, on Peirce's terms, all inference--takes.¹

Peirce maintained that there are three and only three elementary modes of inference: abduction, deduction, and induction² (8.209). It should not be surprising to the
reader by now that this trichotomy is, in Peirce's mind at
least, traceable back to the earlier distinction involving
firstness, secondness, and thirdness. The parallel is per-
haps not really as far-fetched as it might appear at first
blush; for if, as Peirce had claimed, all experience (i.e.,
all that can be the object of thought) may properly be
described in terms of the three elementary categories, it
is not unreasonable to suppose that the thought process it-
self will evidence the operation of those categories.
Nevertheless, for expository purposes (and, also, given the
fact that Peirce himself seemed to waver on the question of
just which mode of inference best exemplifies which cate-
gory\(^3\)), I will temporarily set aside considerations of the
parallels to be drawn. Since Peirce felt that both ab-
duction and induction could be understood in terms of an
ordinary deductive model, we shall consider his views on
that most "respectable" mode of inference—deduction—first.

To Peirce, all deductive reasoning is aptly typified by
the "Barbara" syllogism. For the terms "major premiss,"
"minor premiss," and "conclusion," he substitutes his own
"rule," "case," and "result," respectively. Thus, a simple
deduction would be illustrated by the following syllogistic
model (which Peirce considers an instance of Barbara):

<table>
<thead>
<tr>
<th>RULE</th>
<th>All men are mortal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASE</td>
<td>Enoch is a man.</td>
</tr>
<tr>
<td>RESULT</td>
<td>Enoch is mortal.</td>
</tr>
</tbody>
</table>
"All deduction is of this character; it is merely the application of general rules to particular cases (2.620). These general rules he also calls leading principles (3.164) and consequences (7.107). They are themselves habits of inference; and if they are initially expressed through generalizations couched in simple subject-predicate form (as is the above "rule"), their logical structure is more precisely displayed via conditional statements which assert that if the description contained in the original subject is applicable to anything, then the description contained in the predicate will also be applicable to that thing (3.175). Peirce, however, sees an important distinction to be made between two different types of leading principle. The major premiss in the above syllogism asserts that if something is a man it is also mortal. This is a generalization about the world as it really is—a rule that can be validated only by consideration of contingent conditions, the uniformities of nature; Peirce accordingly terms such generalizations material leading principles (2.590). Without a material leading principle a deduction is incomplete and its conclusion lacks formal necessity. For example, the conclusion of the argument "Enoch is a man; therefore Enoch is mortal" may be denied without contradicting anything explicitly contained in the premiss. It is introduction of the material leading principle "All men are mortal" which "completes" the argument by
necessitating the conclusion in question. Although the argument is complete in that sense however, there is also another leading principle involved: a logical leading principle "which must be supposed true in order to sustain the logical validity of any argument" (3.168). In the syllogism under examination, Peirce cites as the logical leading principle Nota notae est nota rei ipsius, "that is, the predicate of the predicate is the predicate of the subject" (2.590). This logical principle is necessary to the inference, but Peirce maintains that to state it explicitly as an additional premiss will not render the argument "more complete" than it was beforehand:

Now shall the reader add this as a premiss to the compound premiss already adopted? He gains nothing by doing so. For he cannot reason at all without a monstrative sign of illation; and this sign is not really monstrative unless it makes clear the proposition here proposed to be abstractly stated. Nor could any use of that statement be made without using the truth which it expresses (4.76).

Thus, for Peirce, the very nature of a logical principle precludes its own useful involvement inside the argument.

As to the truth status of such principles, Peirce says:

Since it can never be requisite that a fact stated should also be implied in order to justify a conclusion, every logical principle considered as an assertion will be found to be quite empty. The only thing it really enunciates is a rule of inference; considered as expressing truth, it is nothing (2.467).
Logical leading principles, therefore, are to be evaluated not in terms of any truth or falsity they possess in themselves, but rather according to their effectiveness in guiding us from true premisses to true conclusions.

If the logical principles which govern deductions are void of factual reference, so too, according to Peirce, are the deductions themselves when considered in their true essence. The rule and case which constitute the premisses of a deductive argument or inference are the products of supposition on the part of the reasoner; whether or not he has taken the time to determine their degree of "correspondence" to any real states of affairs will not affect the quality of the deduction which he makes from them. As Peirce describes the matter:

In deduction, or necessary reasoning, we set out from a hypothetical state of things which we define in certain abstracted respects. Among the characters to which we pay no attention in this mode of argument is whether or not the hypothesis of our premisses conforms more or less to the state of things in the outward world. We consider this hypothetical state of things and are led to conclude that, however it may be with the universe in other respects, wherever and whenever the hypothesis may be realized, something else not explicitly supposed in that hypothesis will be true invariably. Our inference is valid if and only if there really is such a relation between the state of things supposed in the premisses and the state of things stated in the conclusion. Whether this really be so or not is a question of reality, and has nothing at all to do with how we may be inclined to think (5.161).
If facts happen to match up with the premisses of a valid deductive inference, then of course it is to be expected that there will be a fact corresponding to the conclusion. But deduction in and of itself tells us nothing of the world of facts: the "question of reality" is not spoken to within the province of pure deductive logic. There must then be some point outside the sphere of deductive reasoning at which our thought processes 'touch the ground' so to speak, where reason has—or at least seems to have—more than mere "hypothetical states of things" to operate upon. Remembering Peirce's claim that all thought takes the form of inference, it will hardly do to speak of atomic experiential 'givens' upon which we perform our deductions. Much more is needed—a logic of experience. On Peircean terms, we need a mode, or modes, of inference which furnishes us with factual information, or at least suggests such information, about the real world. This 'informative' type of inference Peirce terms ampliative (2.723), or synthetic (2.623), inference, and it may perhaps best be defined as reasoning to a conclusion whose denial does not involve a formal contradiction with the given premisses but whose premisses do nevertheless add some sort of force to the derived conclusion (2.631). Peirce sees ampliative inference as falling into the two distinct modes of induction and abduction.\(^5\)
In terms of the syllogistic model referred to earlier, Peirce defines induction as reasoning from a case and a result to a rule (2.622). Thus a typical inductive inference might proceed along the lines of "Enoch was a man; Enoch was mortal; therefore, all men are mortal." The inductive reasoner takes an instance (the case) of a class of individuals, determines a property (the result) of that individual, and then infers the rule that all members of that class possess that property. This simple sketch of the inductive process should not of course be construed as implying either that the sample taken is or should be a single instance or that the rule inferred describes a necessary relation. Thus, by way of illustration, Peirce gives a somewhat more detailed account of induction by pointing to the following schema:

\[ S', S'', S''', \text{ etc. form a numerus set} \]
\[ \text{taken at random from among the M's,} \]
\[ S', S'', S''', \text{ etc. are found to be--the proportion } p \text{ of them--P's;} \]
\[ \text{Hence, probably and approximately the same proportion, } p, \text{ of the M's are P's } (2.703). \]

To Peirce, the rule derived should, like all rules, be considered in its conditional, or hypothetical, aspect. It reflects a material consequence, and its acceptance constitutes a habit of thought whereby one is led to expect the situation described in the consequent of the rule upon the occurrence of the situation described in the antecedent.
As such, the rule may then go on to make its own contribution to the guiding and shaping of the inference-process by serving as a material leading principle in the mind's conscious and unconscious deductive inferences.

Questions concerning the validity of a given induction and the ultimate justification of that mode of inference itself do not seem as readily answerable as those pertaining to deduction, as the history of philosophy since the time of David Hume has painfully demonstrated. On Peirce's terms, these questions are really asking 'What is the logical leading principle (or principles) governing inductive inference?' His own answer, in its most deceptively simple phrasing, is: the Uniformity of Nature (3.160n). This answer requires some clarification, however, for at times Peirce forcibly denies that the validity of induction is dependent upon the uniformity of nature (6.410). Pretty obviously, either he is referring to two different senses which may be attached to the word "uniformity"—his own and that of certain other philosophers—or he radically shifted his position on this matter during the course of his long philosophical career. I believe the former description of the situation to be the correct one.

What Peirce interprets such philosophers as John Stuart Mill as meaning by "the uniformity of nature" is:

...the principle that what happens once will, under a sufficient degree of similarity of circumstances, happen
again as often as the same circumstances recur (6.410).

The chief of Peirce's several objections to acceptance of this principle as the justification of induction seems to be that it makes induction to rest upon the notion of causal law and by so doing withholds all validity from those inductive inferences which are performed prior to knowledge of such laws. In a great many cases we perform inductions concerning the occurrence of certain properties when we have no knowledge of any causal relationships existing between those properties; and if we did know the specific causal law which is operative in such circumstances, there would be little or no reason for making the induction, for the law and the inductive consequence would for all practical purposes be identical. The application of general knowledge to particular cases is "deductive in its nature and not inductive" (6.412); and to assume a law in order to deduce that very same law is plainly to reason in one great circle. To counter by saying that it is not particular laws which need to be assumed but merely the lawfulness of the universe in general is, for Peirce, to be laboring under a metaphysical assumption so broad as to be irrelevant to individual inductions (2.766). There is no way to tell whether an induction has 'caught the tail' of a real law except through further inductions; and if it is induction that points out laws, then the assumption of the general
lawfulness of the universe is extraneous. It may serve as a psychological motivation for performing inductions, but as a justification of the inductive mode of inference, or of individual inductions, it is nothing. Perhaps few philosophers were more disposed than Peirce to accept the doctrine of the reality of efficient law, but he saw that it was more properly to be exposed, rather than assumed, by inductive inference.

Peirce's own notion of the Uniformity of Nature is enunciated in his "theorem" that "there is a character peculiar to every possible group of objects" (6.414). As an example that I think will help to clarify his meaning here, let us suppose that all the mountains in the world which are over 10,000 feet in elevation are capped with snow. What our supposition means, or at least implies, is that upon proper examination all such mountains would be found to possess that property. It is readily apparent that what we have asserted in our supposition is a generalization about those mountains, a generalization which purports to describe a uniformity in nature. Now, let us replace this supposition with another: "Ninety-two percent of the mountains of the world which are more than 10,000 feet in elevation are capped with snow." What could be deceptive here is that the uniformity may appear 'imperfect' since the assertion describes a group of objects most of which possess a certain property but not all of which do. We should not
allow ourselves to be misled into drawing this false distinction between 'genuine' uniformities and 'near' or 'imperfect' uniformities, however. Just as moral rules which explicitly admit of 'exceptions' are not less precise nor universally applicable because of such admissions but are merely more linguistically complex, so too an empirical generalization is not more nor less general or universal because of the relative complexity of the state of affairs it describes; and, in turn, that state of affairs is none the less a uniformity despite whatever complexity might be involved in its conceptualization.

The inability of Mill's definition of the "Uniformity of Nature" to encompass this more comprehensive notion of uniformity is, as Peirce sees it, another flaw as far as its serving as the logical leading principle of induction is concerned (6.100). It must, on its own terms, at least when taken literally, reject an inductive inference whose conclusion describes an "imperfect" uniformity such as the one described above; yet it seems clear that an induction which correctly concludes that a certain percentage of objects possess a given property is quite as accurate and valid as one which correctly concludes that all members of a class of objects possess such a property. Peirce's definition of "uniformity" on the other hand is more than able to accommodate the former type of induction; for its sole concern is with the determinate character of the
objects in question, the assumption being that all objects and groups of objects possess such a character simply by virtue of their status as \textit{real} objects. Reverting back to our example, it is entirely possible that mankind might never achieve the means to ascertain the properties of a certain class of mountains; yet it is nevertheless true that those mountains would, at any given point in time, possess a fixed set of properties—a uniformity. And the beauty part of this sort of uniformity is that it appears to be entirely free from any assumption of, or dependence upon, the notion of causal law.

In his fascinating article entitled "The Order of Nature"\textsuperscript{10} (6.395–6.427) Peirce sets forth what he describes as an "important logical principle" concerning the uniformity of nature—that "any plurality or lot of objects whatever have some character in common (no matter how insignificant) which is peculiar to them and not shared by anything else" (6.402)—and offers a "proof"\textsuperscript{11} of its truth. The thrust of this proof seems to be that, putting all questions of causality aside, to merely conceive of a set of objects is to confer an order—a fixed character, or uniformity—among those objects; conversely, to attempt to describe any set of objects, or any possible world, as lacking uniformity is to ensnare oneself in a logical contradiction:
We... see that so long as we regard characters abstractly, without regard to their relative importance, etc., there is no possibility of a more or less degree of orderliness in the world, the whole system of relationship between the different characters being given by mere logic; that is, being implied in those facts which are tacitly admitted as soon as we admit that there is any such thing as reasoning. ... We may... say that the world of chance is merely our actual world viewed from the standpoint of an animal at the very vanishing-point of intelligence. The actual world is almost a chance-medley to the mind of a polyp. The interest which the uniformities of Nature have for an animal measures his place in the scale of intelligence (6.405-406).

The import of Peirce's principle of the Uniformity of Nature in our present context is that if, as it asserts, all possible worlds possess a determinate character, then the inductive method of reasoning from random samples to empirical generalizations is, as Peirce sees it, a sufficient method for discovering the uniformities of the actual world and, indeed, the best such method (8.209). It is sufficient because, although individual inductions may miss the mark of truth quite appallingly, the course of properly-executed inductive inference is "self-correcting" (2.749) and must ultimately reach that mark if carried to sufficient length:

This is the marvel of it. The probability of its conclusion only consists in the fact that if the truth value of the ratio sought has not been reached, an extension of the inductive process will lead to a closer approximation (2.729).

On Peirce's view, it would be frivolous to argue that
induction lacks this guarantee of closer and closer approximation to ultimate accuracy because the finiteness and fallibility of man or the inaccessibility of appropriate samples from which to reason could forever keep a train of inductions from its appointed destination. These are not flaws in the inductive mode of inference itself, and on Peircean terms they no more detract from its validity than the practical difficulties which may accompany the execution of a complex deduction reflect upon the inherent validity of that mode of inference. And induction is the best method for ascertaining the nature of the uniformities of the real world simply because any other method would, on Peirce's view, actually be either a covert form of induction or pure guesswork (i.e., hypothesis formulation, or "abduction," which we shall discuss very shortly).

In an attempt to better illustrate Peirce's view, let us appropriate his favorite imagery for describing induction and suppose for example that two men, A and B, are involved in a bet concerning the proportion of white beans in a fishbowl containing a large number of white and black beans. Let us also suppose that A is a confirmed inductive reasoner while B, on the other hand, claims to use some other method for arriving at predictions. A counts the beans that are visible and bets that the proportion of white beans in the whole bowl is the same as that among those which he has counted. B, however, scoffs at this
simple inductive inference, makes a prediction which is greatly different from A's, is exactly correct and wins the bet. When A questions him as to what brought him to the right answer, B responds by confessing, "I've found that the proportion of white beans in a fishbowl of black and white beans is always the same as the mean yearly temperature of the town in which the bowl is located." What B has done obviously is to perform an induction of his own, albeit one of an extremely dubious character; his "other method" is merely an odd manifestation of the inductive technique of basing predictions on the relation of events in the past. (Even if B had formulated a prediction based on the belief that future events never resemble the past he would of course still be basing predictions of the future on events of the past, or at least what he believed past events to be like. Cf. 5.352). So, too, for Peirce, all methods of reasoning to generalizations are inductive at their cores. (B could formulate a prediction which he might claim was based on the deduction of one generalization from another; but then that latter generalization would, on Peirce's terms, be either itself the product of an induction or of the nature of a hypothesis--and, as we will see in the next few pages, the logical force of hypotheses is, to Peirce, parasitic upon the validity of induction.) As to what approach our dyed-in-the-wool inductive reasoner, A, will take toward bets involving beans and
fishbowls in the future, Peirce would probably say that his problem lies not in deciding whether or not to reject inductive inference itself but only in deciding what data to select as the premisses for his fishbowl inductions. Hopefully, he would realize that his first approach was the right one and that the number of beans he had counted was simply too small to allow for a fool-proof estimate. The more beans he had counted the closer his estimates from known proportions would have tended toward the correct answer, at least in the Peircean "long run." B's form of induction will also have this self-correcting character, for, again in the long run, he will find that the relation between the mean yearly temperature and the number of beans in fishbowls is nil. Thus, both men's inductions are informative; it is just that B's are less likely to be of much assistance in his potential career as a gambler.

Abduction, the third of Peirce's basic modes of inference and the second type of ampliative inference, can, like induction, be most simply described in terms of a rearranged syllogism. It is reasoning from rule and result to case; thus,

RULE -- All men are mortal.
RESULT -- Enoch is mortal.
CASE -- Enoch is a man.

represents a simple abductive inference. It is also, of
course, a fine specimen of the 'fallacy of affirming the consequent', but we must not let that distress us. To Peirce, it is only a fallacy when it purports to be an instance of deductive or inductive inference; as a manifestation of the other mode of inference, abduction, its validity is to be judged solely according to its conformity to the logical leading principle of that mode. (Just what the logical leading principle of abduction might be is a matter which we shall take up in a moment.)

The primary function of abductive inference, as viewed by Peirce, is explanatory, and the rationale behind this form of reasoning is perhaps better displayed in the following sort of schema:

The surprising fact, C, is observed;  
But if A were true, C would be a matter of course,  
Hence, there is reason to suspect that A is true (5.189).

The conclusion of an abductive inference is a hypothesis which is brought into being for the sake of explaining the "surprising" occurrence or event.\(^ {14} \) Peirce accordingly frequently employs the terms 'hypothesis' (e.g., in 5.272) and 'hypothetic inference' (e.g., in 8.385) interchangeably with, or instead of, 'abduction'.\(^ {15} \)

In his early writings Peirce did not appear to have a well-formulated view of abduction as a distinct mode of inference, and he in fact at times characterized 'hypothetic inference' as a species of induction (e.g., in 2.706-707).
As his notion of this form of inference solidified, however, the differences between it and induction became clearer in his mind. One key difference was to be that, although strictly speaking both modes of inference provide us with factual information, it is only abduction that really furnishes us with "new ideas," according to Peirce. He sees induction as merely inferring the existence of phenomena similar to those which have been presented in past experience, while abduction infers the possibility of phenomena with which we have not yet been confronted:

Abduction is the process of forming an explanatory hypothesis. It is the only logical operation which introduces any new idea; for induction does nothing but determine a value, and deduction merely evolves the necessary consequences of a pure hypothesis (5.171).

...generally speaking, the conclusions of Hypothetic Inference cannot be arrived at inductively, because their truth is not susceptible of direct observation in single cases. ... For instance, any historical fact, as that Napoleon Bonaparte once lived, is a hypothesis; we believe the fact, because its effects— I mean current tradition, the histories, the monuments, etc.—are observed. But no mere generalization of observed facts could ever teach us that Napoleon lived (2.714).

As reasoning from observed samples of a class to the character of the complete class itself (or more simply, from part to whole), on Peirce's characterization induction is not qualified to generate conclusions concerning properties not found in the samples; that task is reserved
for abduction.

Besides furnishing "new ideas" in the sense just alluded to, abduction is also credited by Peirce with providing a more primitive kind of new data—indeed, the most primitive—for the mind to work with in its subsequent logical operations:  **perceptions.**

.. abductive inference shews into perceptual judgment without any sharp line of demarcation between them; or, in other words, our first premises, the perceptual judgments, are to be regarded as an extreme case of abductive inferences. .. (5.181).

In attempting to describe the perceptual process in more formalistic terms, Peirce says:

A well-recognized kind of object, M, has for its ordinary predicates $P_1$, $P_2$, $P_3$, etc., indistinctly recognized. The suggesting object, S, has these same predicates, $P_1$, $P_2$, $P_3$, etc. Hence, S is of the kind M.

This is hypothetic inference in form. The first premise is not actually thought, though it is in the mind habitually. This, of itself, would not make the inference unconscious. But it is so because it is not recognized as an inference; the conclusion is accepted without our knowing how. In perception, the conclusion has the peculiarity of not being abstractly thought, but actually seen, so that it is not exactly a judgement, though it is tantamount to one (8.64–65).

A relatively clear-cut illustration of how hypothetic inference is involved in perception has to do with our visual field: despite the fact that there is a large blind spot
on the retina of the normal human eye, we are seldom—if ever—aware of it because the mind automatically fills in the gap in the visual field, 'hypothesizing' an unbroken object of sight (5.220). It should perhaps be pointed out, however, that although Peirce does boldly state that the interpretational aspect involved in all perception "is plainly nothing but the extremest case of Abductive Judgments" (5.185), he at times draws back from saying categorically that perceptual judgments are instances of abductive inference. His hesitation on the matter is attributable to his observation that perceptual judgments are "absolutely beyond criticism" (5.181):

> I do not see that it is possible to exercise any control over... (perceptual judgment)... or to subject it to criticism. If we can criticize it at all, as far as I can see, that criticism would be limited to performing it again and seeing whether, with closer attention, we get the same result. But when we do perform it again, paying now closer attention, the percept is presumably not such as it was before. I do not see what other means we have of knowing whether it is the same as it was before or not, except by comparing the former perceptual judgment and the later one. I should utterly distrust any other method of ascertaining what the character of the percept was. Consequently, until I am better advised, I shall consider perceptual judgment to be utterly beyond control (5.115).

It was just this incorrigibility of perceptual judgments that Peirce found so uniquely atypical of abductive inference in general and made him want to separate the former
off at some level from all other abductive inferences. Whether (what I take to be) his vacillation on the matter points to a significant loose thread along the seam of his theory of inference, however, is a question that lies beyond the intended scope of this paper.

If the differences between induction and abduction became clearer to Peirce with the passage of time, he seems nevertheless to have been unable to totally dissociate the two when trying to formulate the logical leading principle governing the validity of the latter mode of inference. Such a formulation appears to have been especially problematic for him, if one is to judge by the fact that he offers no explicit reference in the *Collected Papers* to an abductive counterpart to induction's 'Uniformity of Nature' and, in fact, writes sometimes as though he had about given up hope of ever discovering abduction's justification:

As for the validity of the hypothesis . . . (i.e., abductive inference). . . there seems at first to be no room at all for the question of what supports it, since from an actual fact it only infers a *may-be* (may-be and *may-be not*). But there is a decided leaning to the affirmative side and the frequency with which that turns out to be an actual fact is to me quite the most surprising of all the wonders of the universe (8.238).

Induction is justified as a method which must in the long run lead up to the truth, and that, by gradual modification of the actual conclusion. There is no such warrant for. . .(abduction). The hypothesis which it problematically concludes is frequently utterly wrong itself,
and even the method need not ever lead to the truth; for it may be that the features of the phenomena which it aims to explain have no rational explanation at all. Its only justification is that its method is the only way in which there can be any hope of attaining a rational explanation (2.777).

Nonetheless, Peirce is capable of saying with apparent self-assurance (fairly late in his career):

The validity of a presumptive adoption of a hypothesis for examination consists in this, that the hypothesis being such that its consequences are capable of being tested by experimentation, and being such that the observed facts would follow from it as necessary conclusions, that hypothesis is selected according to a method which must ultimately lead to the discovery of the truth, so far as the truth is capable of being discovered, with an indefinite approximation to accuracy (2.781).

I think the crucial points (for our present area of discussion) that Peirce is making here are that abduction is to be viewed as part of a larger inferential process which assures the ultimate accuracy of a chain of hypotheses and that, as such, its justification is dependent upon the justification of induction. The process proceeds, he seems to be saying, something like this:

1. A fact is noted.

2. An hypothesis is formulated to explain the fact.

3. The meaning of the hypothesis is elicited, or at least is elicitable, in terms of conditional propositions amenable to experimental confirmation or refutation. (In other words, the hypothesis must be
able to survive application of
the pragmatic criterion of
meaning.)

4. The fact is deduced, or at least is
deducible, from one or more of these
conditional propositions. (That is,
in principle a valid syllogism could
be constructed in which the major
premiss would be one of the con-
ditional propositions and the fact
would be the conclusion.)

5. The truth of the conditional propositions
is either confirmed or falsified through
induction.

And if the employment of inductive methodology confirms the
hypothesis, it to that extent 'justifies' it; if it falsi-
fies the hypothesis it (A) tells us a fact about the real
world (i.e., it tells us what is not true of the real
world), and thereby (B) that much delimits the range of
hypotheses which might explain the fact in question. 19
Both A and B bring us, however infinitesimally, closer to
an accurate explanation of the fact which the hypothesis in
question was designed to explain. Whether or not these last
remarks correctly and adequately reflect what Peirce had
in mind though, the claim that he saw the justification of
abduction as being dependent upon that of induction is
further substantiated in the following passage:

Abduction merely suggests something that
may be. Its only justification is that
from its suggestion deduction can draw a
prediction which can be tested by in-
duction, and that, if we are ever to learn
anything or to understand phenomena at all,
it must be by induction that this is to be
brought about (5.171).
Peirce is willing to concede that abduction is the weakest of the three fundamental modes of inference (2.102) (individual hypotheses possessing little, if any, argumentative force in themselves); but in characterizing abductive inference as being dependent upon induction for its justification, he seems in effect to be saying that to deny that scrupulous and sufficiently prolonged adherence to abductive procedures would ultimately lead to truth is to deny the 'Uniformity of Nature' (the logical leading principle of induction) and so, on Peirce's terms, to maintain a literally absurd position (5.352).

At this point it might be worthwhile to spend a moment considering what relationships, if any, exist for Peirce between his three fundamental modes of inference and his phaneroscopic categories. This, as the following remark suggests, is yet another highly-problematic area for Peirce scholars to deal with:

Concerning the relations of these three modes of inference to the categories and concerning certain other details, my opinions, I confess, have wavered. These points are of such a nature that only the closest students of what I have written would remark the discrepancies. Such a student might infer that I have been given to expressing myself without due consideration; but in fact I have never, in any philosophical writing...made any statement which was not based on at least half a dozen attempts, in writing, to subject the whole question to a very far more minute and critical examination than
could be attempted in print, these attempts being made quite independently of one another, at intervals of many months, but subsequently compared to-
gether with the most careful criticism . . . . My waverings, therefore, have never been due to haste (5.146).

The "waverings" which Peirce is referring to seem primarily to concern the question of whether induction or deduction is to be viewed as the mode of inference best exemplifying the effective presence of the category of thirdness. With respect to abduction, Peirce's position seems to have been fairly stable: abduction is most appropriately to be thought of as predominated by firstness, both in its function as the medium for perceptual judgment and as the process governing the conscious formulation of hypotheses. In the former role it is the inferential mode of sensation--the area of experience most dramatically suffused with feeling and quality, firsts; in the latter capacity it is reasoning to possibilities ("may-be's"), also firsts. Induction and deduction were apparently much harder for Peirce to pigeonhole, however. On the one hand, induction is (with reference to the syllogistic model) reasoning to rules and (as a tool of scientific inquiry) to laws, both prime exemplars of thirdness (see, e.g., 2.86); but, on the other hand, it is deduction which, as the mode of necessary inference, seems to most intractably exhibit elements of lawfulness and unrestricted generality (5.150), thirds again. If Peirce can rightly be said to have settled on a
particular category/inference-mode correspondence (and I'm not sure he can) it would appear to be along the lines of:
firstness/abduction, secondness/induction, thirdness/deduction, as the following brief description (written in 1903) strongly implies (at least to someone attuned to Peirce's penchant for oblique references to his categories in any and all contexts):

Deduction proves that something must be;
Induction shows that something actually is operative; Abduction merely suggests that something may be (5.171).

I have my own doubts though about the 'practical' value of Peirce's mental agonizings over these matters and would rather point out a more general sort of relationship (or, at least, parallel) existing between his categories and modes of inference. I take it (however implicitly stated) to be Peirce's view that just as the categories of firstness, secondness, and thirdness may meaningfully be distinguished from each other while in reality no manifestation of any one of the three is completely free of intrusion by the other two, so likewise abduction, induction, and deduction are distinguishable as elementary modes of inference and yet no actual instance of any type of inference is to be found which is wholly independent of the effects of the other two. This is not only to say that the three modes work together in a kind of 'linear' progression, one mode taking up where another leaves off, as we saw to be
the case in the process of testing hypotheses, but that a 'vertical' interaction obtains as well—the internal structure of any instance of one inferential mode determined by the overlapping operation of instances of the other two. To help illustrate this latter point, let us first look at an interesting claim of Peirce's, i.e., that the psychological/physiological act of attention exhibits the logical form of inductive inference:

Attention is roused when the same phenomenon presents itself repeatedly on different occasions, or the same predicate in different subjects. We see that A has a certain character, that B has the same, C has the same; and this excites our attention, so that we say, "These have this character." thus attention is an act of induction. . . . It is, in short, an argument from enumeration.

Attention produces effects upon the nervous system. These effects are habits, or nervous associations. A habit arises, when, having had the sensation of performing a certain act, m, on several occasions a, b, c, we come to do it upon every occurrence of the general event, l, of which a, b, or c, are special cases. That is to say, by the cognition that

Every case of a, b, or c, is a case of m, is determined the cognition that

Every case of l is a case of m.

Thus the formation of habit is an induction, and is therefore necessarily connected with attention or abstraction (5.296-297).

Now, if attention is but a covert species of induction, and if some modicum of attention is involved in all reasoning (seemingly an innocent enough assumption), then it follows
that induction is an element in all reasoning. With respect to deduction, Peirce sees the "consistency of thought with itself" (3.160n) to be both an assumption of that mode of inference and a reflection of its active presence in all thinking. This presence is perhaps best exhibited when we consider deduction in the following light:

In deduction the mind is under the dominion of a habit or association by virtue of which a general idea suggests in each case a corresponding reaction (6.144). . . . By deduction the habit fulfills its function by calling out certain reactions on certain occasions (6.146).

Since all thought would seem to involve such consistency of 'reaction' as a prerequisite for its internal coherence, every phase of the inferential process, on Peircean terms, actively employs deduction. And since "the elements of every concept enter into logical thought at the gate of perception" (5.212) and perception "is plainly nothing but the extremest case of Abductive Judgment" (5.220), it also appears to follow that abduction must also permeate the whole of inference. Thus, reasoning is to be viewed as a highly complex, coordinated process, each inferential line of which is necessarily involved with others in an intricate contrapuntal relationship.

Pragmatism as the Logic of Abduction

In preparing to conclude this chapter, I would like to
briefly speak to two significant claims which Peirce makes regarding the relevance of elements of his theory of inference to the pragmatic criterion of meaning:

...pragmaticism is simply the doctrine that the inductive method is the only essential to the ascertainment of the intellectual purport of any symbol (8.209).

If you carefully consider the question of pragmatism you will see that it is nothing else than the question of the logic of abduction (5.196).

At first blush these two claims might appear to be mutually incompatible, reflective perhaps of Peirce's changing views concerning the right of abduction to rank as fundamental mode of inference on the order of deduction and induction. I do not take such to be the case, however. In the next few pages we will focus our attention upon attempting an explanation of the second claim, and in so doing I think we will see how the first falls fairly naturally and neatly into place.

In his monograph Peirce's Theory of Abduction, K. T. Fann explains the latter of Peirce's above-mentioned two claims in the following manner:

Perhaps the contention that pragmatism is the "logic of abduction" will now be clearer. After all, "Abduction must cover all the operations by which theories and conceptions are engendered" (5.590). However, we should not understand Peirce to be meaning that pragmatism is the whole of the logic of abduction. In fact pragmatism is only concerned with the "admissibility of hypotheses to rank as hypotheses" (5.196). Any hypothesis is
admissible, according to pragmatism, if it is capable of experimental verification. But which one out of a number of admissible hypotheses should be tested first involves the question of economy (of research) which is not a part of pragmatism. Thus, pragmatism should be regarded as an essential element of abduction instead of the whole of the logic of abduction.²¹

Fann appears to be saying here that pragmatism is "the logic of abduction" in the sense that pragmatism, as a criterion of meaning used as a tool of scientific method, declares as meaningless (and therefore inadmissible) those hypotheses which are not experimentally verifiable. Now, it is certainly incontestable that this is one sense in which pragmatism is relevant to the logic of abduction, but, to the extent that it strongly implies that this is the whole of Peirce's meaning in describing "the question of pragmatism" as "the question of the logic of abduction," I think Fann's characterization is seriously flawed. I think the fact that almost any criterion of meaning—right or wrong, pragmatic or non-pragmatic—would distinguish between meaningful and meaningless hypotheses (and so, to that degree, govern "the admissibility of hypotheses to rank as hypotheses") suggests that Peirce saw a closer sort of bond than that as existing between the pragmatic criterion of meaning and the logic of abduction. Accordingly, I would like to distinguish three different (though intimately related) senses in which that criterion of meaning may be viewed as bearing on the question of the logic of abduction:
(a) The pragmatic criterion of meaning governs the admissibility of hypotheses to rank as hypotheses by rejecting as meaningless those hypotheses (pseudo-hypotheses) which are incapable of experimental verification or falsification (Fann's point).

(b) The pragmatic criterion of meaning explicates, and thereby clarifies, the meaning of hypotheses.

(c) The pragmatic criterion of meaning purports to exhibit pivotal elements involved in the process of apprehending the meaning of a concept; that process is distinctively abductive in character.

In eliciting certain key features of these senses, it will prove helpful to refer back at times to the five-stage skeletal depiction of the abductive process which appears on page 101 of this study.22

(a) I think the basic meaning of this point is sufficiently clear that it requires little additional elucidation here. (Looking back at the five stages of the broad abductive process, page 101 we may for present purposes roughly equate (a) with stage 3.) What is worth focusing on for a moment though is the question of just how severe or stringent does application of the pragmatic
criterion of meaning prove to be. In his philosophical youth, Peirce seemed rather 'tough-minded' in describing the impact which the criterion of meaning would have upon certain 'vague shadows of ideas', i.e., meaningless pseudo-ideas, and in How to Make Our Ideas Clear the initial statement of the pragmatic maxim is textually sandwiched between two destructive analyses of such "shadows." He first dissects the Catholic Church's doctrine of transubstantiation:

. . . Catholics maintain that. . . (the elements of the sacrament). . . are literally just meat and blood; although they possess all the sensible qualities of wafer-cakes and diluted wine. But we can have no conception of wine except what may enter into a belief, either--

1. That this, that, or the other, is wine; or,
2. That wine possesses certain properties.

Such beliefs are nothing but self-notifications that we should, upon occasion, act in regard to such things as we believe to be wine according to the qualities which we believe wine to possess. The occasion of such action would be some sensible perception, the motive of it to produce some sensible result. . . . We can consequently mean nothing by wine but what has certain effects, direct or indirect, upon our senses; and to talk of something as having all the sensible characters of wine, yet being in reality blood, is senseless jargon (5.401).

Then, after enunciating the pragmatic maxim, Peirce proffers an even more positivistic sounding analysis of our notion of "hardness":
The whole conception of this quality, as of every other, lies in its conceived effects. There is absolutely no difference between a hard thing and a soft thing so long as they are not brought to the test. Suppose, then, that a diamond could be crystalized in the midst of a cushion of soft cotton, and should remain there until it was finally burned up. Would it be false to say that that diamond was soft? . . . We may, in the present case, modify our question, and ask what prevents us from saying that all hard bodies remain perfectly soft until they are touched, when their hardness increases with the pressure until they are scratched. Reflection will show that the reply is this: there would be no falsity in such modes of speech. They would involve a modification of our present usage of speech with regard to the words hard and soft, but not of their meanings. For they represent no fact to be different from what it is. . . (5.403).

Although he tries to maintain the facade of 'toughness' more than twenty-five years later, stating, for example, that pragmatism

. . . will serve to show that almost every proposition of ontological metaphysics is either meaningless gibberish. . . or else is downright absurd; so that all such rubbish being swept away, what will remain of philosophy will be a series of problems capable of investigation by the observational methods of the true sciences. . . (5.423).

it becomes clear that Peirce and his criterion of meaning have mellowed during the interim, as the following passages, from 1902 and 1905, respectively, reflect. In the first he re-examines the doctrine of transubstantiation:

The Roman Church requires the faithful to believe that the elements of the eucharist are really transformed into flesh and blood,
although all their "sensible accidents," that is, all that could be expected from physical experience, remain those of bread and wine. . . . But the layman declares that he cannot understand the difference. "That is not necessary," says the priest, "you can believe it implicitly." What does that mean? It means that the layman is to trust that if he could understand the matter and know the truth, he would find that the priest was right. . . . The implication is that the layman may sometime know, presumably will, in another world; and that he may expect that if he ever does come to know, he will find the priest to be right (5.541).

And in next he criticizes his former view concerning the nature of the hardness of diamonds:

. . . it is the reality of some possibilities that pragmaticism is most concerned to insist upon. The article of January 1878 endeavored to gloze over this point. . . or perhaps the writer wavered in his own mind. . . . Let us now take up the case of that diamond which, having been crystallized upon a cushion of jewelers cotton, was accidentally consumed by fire before the crystal or corundum that had been sent for had had time to arrive, and indeed without being subjected to any other pressure than that of the atmosphere and its own weight. The question is, was that diamond really hard? It is certain that no discernible actual fact determined it to be so. But is its hardness not, nevertheless, a real fact? . . . Is it not a monstrous perversion of the word and concept real to say that the accident of the non-arrival of the corundum prevented the hardness of the diamond from having the reality which it otherwise, with little doubt, would have had? (5.453-457)²³

To fully appreciate the reasons behind Peirce's renunciation of his former views on these matters requires an understanding of his notion of "scholastic realism," and
discussion of this latter issue is, I think, better deferred to succeeding chapters of this study. Nevertheless, at the present time I believe we can discern at least a partial explanation of the nature of Peirce's recantations by noting that in *How to Make Our Ideas Clear*, Peirce, like a good empiricist, was keying on the notion of "sensible effects" as the heart of his pragmatism, and this led to harsh treatment of concepts which, seemingly by definition, involve no such effects. Though never forsaking his empiricist ties, in later years Peirce's pragmatism had been refined in such a way that it explicitly characterizes meaning as residing in the collective sum of "practical consequences" or "conditional resolutions for action" pertinent to a concept or hypothesis. So refined, pragmatism turns out to be a rather liberal arbiter of meaningfulness, countenancing "any flight of imagination" which might "conceivably concern practical conduct":

...and thus many hypotheses may seem at first glance to be excluded by the pragmatical maxim that are not really so excluded (5.196).

(b) If the pragmatic criterion of meaning proves to be a relatively easy-going censor (unlike its positivistic counterparts; see, e.g., 5.597 and 5.198) when it comes to the potential rejection of hypotheses as meaningless, such tolerance does not in Peirce's mind reflect a diminished capacity of that criterion for functioning as a logical
tool to facilitate the translation of such hypotheses into more precise terms. This is the second of what Peirce sees as the two primary "offices of Pragmatism" (the first "office" being the function we touched upon in the preceding paragraph):

(Pragmatism). . .ought to lend support, and help to render distinct, ideas essentially clear, but more or less difficult of apprehension (5.206).

In considering this function, if we refer back to the five stages of the abductive process sketched out on page 101, our attention immediately focuses once again upon stage 3, i.e., the stage at which the meaning of a hypothesis is to be elicited by reconsidering the hypothesis in terms of conditional propositions amenable to experimental confirmation or falsification. A peculiar feature of stage 3, however, is its implicit connection with stage 5, for the former involves the conceived realization of the latter. In other words, application of the pragmatic criterion of meaning to any hypothesis (the hypothesis being the product of abductive inference) will involve the conceived testing of the truth of that hypothesis through employment of inductive methodology. The following version of the pragmatic criterion of meaning attempts to take into account the reference to induction which Peirce sees as implicit in meaning-assessment:

. . .Pragmatism asserts that the total meaning of the predication of an
intellectual concept is contained in an affirmaiton that, under all conceivable circumstances of a given kind (or under this or that more or less indefinite part of the cases of their fulfillment, should the predication be modal) the subject of the predication would behave in a certain general way—that is, it would be true under given experiential circumstances (or under a more or less definitely stated proportion of them, taken as they would occur, that is in the same order of succession, in experience) (5.467).

I take it to be just this sort of involvement of induction in the meaning-assessment process that prompts Peirce to make the first of the two claims cited on page 108, and to observe (in the same paper in which he equates "the question of pragmatism" with "the question of the logic of abduction") that:

Any hypothesis . . . may be admissible, in the absence of any special reasons to the contrary, provided it be capable of experimental verification, and only insofar as it is capable of such verification. This is approximately the doctrine of pragmatism. But just here a broad question opens out before us. What are we to understand by experimental verification? The answer to that involves the whole logic of induction (5.197).

We saw a few pages back how abduction may be construed as being parasitic for its justification upon inductive methodology; we see now that the products of abductive inference, hypotheses, are in their turn dependent upon that methodology for their very meaning.
(c) In the first chapter of this study (page 45), I noted that the pragmatic criterion of meaning is derivable from the descriptive phase of logic, and in that chapter I attempted to show, in very rough terms, how that criterion does indeed follow from Peirce's work in Speculative Grammar, the theory of signs. Once derived, the decision as to how we ought to employ that criterion in future reasoning is a decision to be made within the realm of prescriptive logic. Any possible discussion of this latter question, however, should not obscure the fact that the pragmatic criterion of meaning purports to describe the actual manner in which the meanings of concepts are understood. Peirce seems to be referring to this fact (in a letter to William James in 1902) when he says:

In philosophy those who think themselves pragmatists, like Mr. Schiller, miss the very point of it, that one simply can't form any conception that is other than pragmatistic (8.254).

If we tentatively agree with Peirce that pragmatism does indeed accurately describe the essentials of the manner in which concepts are apprehended, and if we further grant the point that "every exercise of the mind consists in inference" (5.318), inference which is categorizable as deductive, inductive, or abductive, it would seem to be a legitimate undertaking to inquire into the distinctive inferential character of the mental activity involved in apprehending a concept. This latter question is rather
ambiguous though, and perhaps we can remedy some of that ambiguity by distinguishing two possible senses to it:

(1) What is the inferential mode most prominent in concept-formation? and,

(2) What is the inferential mode most prominent in sign-interpretation?

Peirce's views concerning (1) seem clear enough. As we have already seen, all "new ideas" are formed through the medium of abductive inference: "...Abductions must cover all the operations by which theories and conceptions are engendered" (5.591). Succinctly stated, the rationale for such a claim is as follows: "Hypothesis substitutes, for a complicated tangle of predicates attached to one subject, a single conception" (2.643). 23 Peirce's views with respect to (2) are a bit less straightforward, but I believe that we should find the following description of how we interpret a certain kind of problematic sign to be highly suggestive:

You hear a new slang word; you never ask for a definition of it; and you never get one. You do not get even any simple example of its use; you only hear it in ironical, twisted, humorous sentences whose meaning is twisted inside out and tied in a hard knot; yet you know what that word means much better than any abstract definition could have informed you. ... Such inferences are beyond the jurisdiction of criticism (7.447-448).

It would appear that, on Peirce's terms, the type of inference being described in this passage must be abductive.
(It certainly does not possess the logical force of
deduction; and, at least as Peirce sets up the example, it
does not seem in any very prominent way to involve in-
duction, i.e., reasoning from a property of an instance,
or instances, of a class of individuals to a conclusion
that all, or some proportion of, members of that class
possess that property.) The occurrence of the slang word,
a sign, constitutes an event, a "surprising fact" (see
page ), that begs for explanation; the interpretation of
the sign constitutes the explanation and, however uncon-
scious the inference involved, functions as a hypothesis
that can be confirmed or falsified (inductively) through
future experience involving the same class of sign. Em-
ployment of the term "surprising" in reference to the
occurrence of a sign could, though useful, be a little mis-
leading; for most sign-interpretation, unlike that des-
cribed in the example, obviously involves quite familiar
signs, the occurrence of which is 'surprising' only in the
most Pickwickian of senses. In making the transition from
considering unfamiliar signs to considering familiar ones,
however, I think we should take special note of the last
sentence in the above passage— that is, "Such inferences
are beyond the jurisdiction of criticism." Here Peirce is
using the same characterization which in other contexts he
applies to perceptual judgments, the most rudimentary
instances of abductive inference. And if we resurrect
(see page 98) Peirce's schematic model of perceptual abductions—

A well-recognized kind of object, M, has for its ordinary predicates $P_1$, $P_2$, $P_3$, etc., indistinctly recognized. The suggesting object, S, has these same predicates, $P_1$, $P_2$, $P_3$, etc. Hence, S is of the kind M (8.64).

—I think we can see that, upon substituting the term "sign" for "object," that model is quite as applicable to the process of sign-interpretation as it is to the process of perceptual judgment. Thus, for example, just as when I look at my hand, an object I have observed countless times, my perception of it as my hand is nonetheless an abductive inference unifying and explaining a certain set of visual data, so too when I hear the word "hand," a word I have heard and understood countless times, my interpretation of that word-sign as referring to a hand is an abductive inference explaining the use and meaning of that word-sign. Therefore, I am suggesting, on Peircean terms there is no significant difference between the logical structure of the act of perceiving the character of a physical object and that of the act of interpreting and apprehending the meaning of a sign. If this be true, then pragmatism, as a method of sign-interpretation, turns out to be merely a somewhat specialized version of the logic of abduction.

In summarizing points (a), (b), and (c), we could say that pragmatism, as a criterion of meaning, not only governs
the admissibility of any hypothesis, but--relating (b) and (c)--it generates further hypotheses which purport to explicate the meaning of the original hypothesis. Assuming the soundness of this characterization, it is hardly surprising that Peirce is given to espousing such broad claims as "pragmatism covers the entire logic of abduction" (5.196) and "the question of pragmatism is the question of the logic of abduction" (Ibid).
NOTES TO CHAPTER II

1 The purely expository passages of this chapter are aimed at providing a simplified but coherent enough description of Peirce's views on the 'modes of inference' to facilitate the extraction of considerations relevant to the central themes of this study. For more detailed treatment of some of the important issues raised by Peirce's theory of inference, see Chung-Ying Cheng's Peirce's and Lewis's Theories of Induction (The Hague, Martinus Nijhoff, 1969) and K. T. Fann's Peirce's Theory of Abduction (The Hague, Martinus Nijhoff, 1970).

2 A trichotomy whose first delineation Peirce credits to Aristotle (2.776) and (8.209).

3 See pp.103-104 of this study.

4 Peirce finds subject-predicate, antecedent-consequent, and premise-conclusions relationships to be virtually equivalent to one another (4.3, 4.76, 3.175). See also p. 66 of this study.

5 Peirce also gives due recognition to analogy but views it as a combination of other modes of inference (cf. 5.277, 2.513, and 1.65).

6 See p. 64 of this paper on the matter of "consequences."

7 Or, stated rather more provocatively, "there... (is) . . . any reality" (5.349).

8 A point well made by R. M. Hare in Freedom and Reason (New York, Oxford University Press, 1963), p. 39: "...universalism is not the doctrine that behind every moral judgement there has to lie a principle expressible in a few general terms; the principle, though universal, may be so complex that it defies formulation in words at all. But if it were formulated and specified, all the terms used in its formulation would be universal terms."

9 As to the possible question of what property do all the mountains in our example have in common, the answer is
that they all belong to a class of mountains over 10,000 feet in elevation and 92 percent of which are capped with snow.

The fifth in the series of six articles for the *Popular Science Monthly* referred to on p. 2 of this study. The title of the article is not Peirce's however, but rather was assigned by the editors of the *Collected Papers*.

The proof:

The word "character" here is taken in such a sense as to include negative characters, such as incivility, inequality, etc., as well as their positives, civility, etc. To prove the theorem, I will show what character any two things, A and B, have in common, not shared by anything else. The things, A and B, are each distinguished from all other things by the possession of certain characters which may be named A-ness and B-ness. Corresponding to these positive characters are the negative characters un-A-ness, which is possessed by everything except A, and un-B-ness, which is possessed by everything except B. These two characters are united in everything except A and B; and this union of the characters un-A-ness and un-B-ness makes a compound character which may be termed A-B-lessness. This is not possessed by either A or B, but it is possessed by everything else. This character, like every other, has its corresponding negative un-A-B-lessness, and this last is the character possessed by both A and B, and by nothing else. It is obvious that what has thus been shown true of two things is mutatis mutandis, true of any number of things. Q.E.D.

In any world whatever, then, there must be a character peculiar to each possible group of objects (6.402-403).

Peirce goes into considerable detail on the matter of what conditions should ideally be observed in reasoning inductively, particularly with respect to the methodology to be employed in the selection of data samples (see, e.g., 2.715-740). I have avoided treatment of them here because I do not think examination of them is essential to the
understanding of issues raised in this and subsequent chapters. They should, however, be examined by the reader if the compactness of my exposition has misled him or her into imagining that Peirce's views on induction were shallow or simplistic.

13 For samples of Peircean beans, see 2.621, 2.692, 5.275, 5.349, and 6.411.

14 There is an interesting and obvious structural similarity between Peirce's abduction and what Bertrand Russell describes as induction in his *The Scientific Outlook* (New York, W. W. Norton & Co., 1931), pp. 74-75:

All inductive arguments in the last resort reduce themselves to the following form: "If this is true, that is true; now that is true, therefore this is true." This argument is, of course, formally fallacious. Suppose I were to say: "If bread is a stone and stones are nourishing, then this bread will nourish me; now this bread does nourish me; therefore it is a stone, and stones are nourishing." If I were to advance such an argument, I should certainly be thought foolish, yet it would not be fundamentally different from the arguments upon which all scientific laws are based.

15 Also 'reproduction' (7.97), 'conjecture' (1.608), and 'presumption' (2.774). 'Retroduction' appears to have been the term of choice during Peirce's very last years, but since 'abduction' was the term most frequently employed in much of Peirce's most interesting writings on the subject, I have selected it for use in this study.

16 This notion of "new ideas" is, of course, far from unproblematic. Literally speaking, the conclusion of any inference (save, perhaps, inferences of the form A - A) is a new idea to the extent that it constitutes a formulation not appearing in the premisses of the inference. The conclusion of a deductive inference might be viewed as lacking "novelty" inasmuch as it is formally implicit in the premiss(es), but the same cannot be said of induction, which infers a "connection" between items of experience. The connection itself (many would say) is not given in experience, and in common parlance we would term the attribution of such a connection an "hypothesis." Muddying the issue further is a point that we will develop in Chapter IV—
that an important feature of abductive inference is the use to which it puts "old ideas" (referred to by Peirce as 'collateral acquaintance').

If I may be permitted one more note on this matter (see note 14), the similarity of Russell's view of induction to Peirce's view of abduction is sustained through the former's account of historical facts and perceptual judgements, even to the point of his using the very same example as Peirce to help illustrate his (Russell's) view:

"...the past existence of Caesar and Napoleon, the present existence of the earth and the sun...may...be regarded as brute facts. That is to say, most of us accept them as such, but strictly speaking, they involve inferences which may, or may not, be correct...Very few teachers of history, I believe, would be able to produce any good argument to show that Napoleon was not a myth... Does the sun exist? Most people would say that the sun does come within our direct experience in a sense in which Napoleon does not, but in thinking this, they would be mistaken. The sun is removed from us in space as Napoleon is removed from us in time. The sun, like Napoleon, is known to us only through its effects... The sun...is an inference from what we see, and is not the actual patch of brightness of which we are immediately aware (Op. cit., pp. 71-73).

Russell goes on to indicate that the type of inference involved in such matters is induction.

My use of the term "perception" is perhaps potentially ambiguous inasmuch as Peirce distinguishes between perceptual judgments and percepts, the latter being those elements (e.g., "an image or moving picture or other exhibition") of experience which occasion perceptual judgments. Unless otherwise indicated, my use of the term "perception" is intended as equivalent in meaning to "perceptual judgment." (Peirce's view of the perceptual process gets rather complex, e.g., as it is described in 7.643-650, but I believe that in the present context we may legitimately bypass some of the finer distinctions which he draws.
I take such points to be partly what Peirce has in mind when he says, for example, "all physical theories originate in human conjectures, and experiment...lops off what is erroneous and determines exact values" (7.687).

In his excellent book The Pragmatic Philosophy of C. S. Peirce (Chicago, University of Chicago Press, 1953), pp. 98-99 and p. 279, Manley Thompson speaks to the matter of deduction and induction having "changed places with respect to the categories they express" in Peirce's writings. He points out, on the basis of the content of 2.643, that by 1902 Peirce was characterizing induction as the inferential mode best exemplifying thirdness, deduction to be associated with secondness. The fact that Thompson leaves the matter at that could perhaps be taken as implying that this was Peirce's final position on this question. Whether or not such an implication is intended, however, it should be pointed out that certain passages in Peirce's writings which support the view that Peirce saw deduction as the mode corresponding to thirdness (e.g., 5.171, 5.146-150) postdate the 2.643 passage.


Use of the term "stage" is not intended to imply any rigid notion of the temporal order of those stages.

Peirce's soul-searching over his diamond example (cf. also 1.615 and 8.208) may well have had its basis in an indecision as to the extent to which the example hinged on a counterfactual statement. Peirce apparently never did make his peace with counterfactuals, as this passage, written the year before his death, reflects:

A historian simply talks nonsense when he says "If Napoleon had not done as he did before the battle of Leipzig (specifying in what respect his behavior is supposed different from what it was) he would have won that battle." Such historian may have meant something; but he utterly fails to express any meaning... A conditional proposition with a similar antecedent known to be false, is worse than a puerility. It is downright nonsense, a series of words without meaning (8.382).

See also 2.712.
CHAPTER III

THE PRAGMATIC CONCEPTIONS OF TRUTH
AND REALITY

In the two preceding chapters we have uncovered the rudiments of what I take to be some very significant links between Peirce's theory of meaning and his notion of truth. We have seen that the pragmatic criterion of meaning elicits the intellectual meaning of signs by gauging their fitness to function as (or function in) truth-claims and that the practical consequences generated through application of that criterion describe the experiential conditions which would serve to validate such claims as indeed being true. We have also noted the not unrelated fact that the pragmatic criterion of meaning is intimately involved with—and in application is itself a species of—the logic of abduction, the mode of inference by means of which all theories (indeed, all truth-claims) are engendered. Furthermore, I believe that in those two chapters we have usefully laid the groundwork for additional insights, to be developed in this and the remaining chapters of the study, into the Peircean meaning/truth connection. That much done, I think that we have now come to a point in our study propitious for an attempt at wrestling with Peirce's joint definitions of 'truth' and 'reality'.

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As a criterion of meaning for all genuine signs, Peirce's pragmatism becomes at once a tool of both descriptive and prescriptive logic. Having been derived from a theory of signs in which the chief concern was to determine what characteristics a sign must in fact possess in order to function meaningfully, it is also equipped, as Peirce sees it, to serve in a normative capacity by guiding human thought toward the *summum bonum* of concrete reasonableness by furnishing us with the means to expose and so dispense with those essentially unclear signs (pseudo signs) which have had a particularly deleterious effect upon the course of philosophical inquiry and to clarify the significance of other signs by culling from them the kernels of meaning which have become obscured through loose usage or their own inherent complexity. In its normative role pragmatism, if accepted, seemingly cannot help but leave the distinctive marks of its application upon such beclouded but epistemologically important concepts as those of *truth* and *reality*, but in actuality the relationship between the pragmatic maxim and the products of its application is sometimes far less than self-evident. In "How To Make Our Ideas Clear," Peirce seems to view his definitions of 'truth' and 'reality' as following rather straightforwardly from application of the maxim. Perhaps in a sense they do; but there are certain concealed assumptions at play with respect to both the
maxim and the definitions generated, and it is, I think, his failure to make those assumptions explicit that rendered the definitions somewhat mystifying to some of his readers. In this chapter I will attempt to sketch out some of those assumptions. The goal is twofold: first, to show why application of the pragmatic criterion of meaning to the notions of 'truth' and 'reality' yields the particular definitions which it does (rather than any of a number of other possible definitions which might, superficially at least, seem appropriate for generation); and secondly, to isolate such assumptions as appear to be held in common by both Peirce's theory of meaning and his (epistemo-
logical)\textsuperscript{1} theory of truth/reality.

In attempting to give a clear definition of any term, including the term 'truth', we must, on pragmatic grounds, be able to adduce those practical consequences, or habits of action, which are implicitly referred to in applying that term. We must, in other words, be able to muster up some hypothetical statement or statements which would allow us to pinpoint the real difference in meaning effected by predicating that term of something. For example, if I say "This object is hard and slippery," a listener might associate such consequences as 'If I bang my fist against that object, I will feel pain' and 'If I press my finger against the object, my finger will slide'
with my assertion. If, however, I make the statement "This object is hard and bepozled," my assertion would apparently trigger in the mind of the listener no association with any practical consequence not also associated with the statement that the object is hard and non-bepozled. To say of an object that it is hard and bepozled is therefore, pragmatically speaking, to meaningfully state nothing more than that the object is hard.

Extending this way of thinking to the question of the meaning of the term 'truth', if the term 'truth' has any fixed meaning at all for us we ought, on the Peircean view, to be able to associate with that term some conditional statement which designates a testing procedure that would, if practicable, enable us to determine when that term had been appropriately or inappropriately used. The antecedent of that conditional will state the manner in which the test is to be performed, and the consequent will state the anticipated result; and our tendency to expect the situation described in the consequent upon the obtaining of the conditions described in the antecedent constitutes a habit of thought and action which comprises the whole intellectual meaning which the term 'truth' holds for us.

Assuming for the moment (as Peirce does) that truth and falsity are at least predicable of meaningful propositions, one practical consequence which might come to mind most naturally with regard to the assertion of a given
proposition's truth is 'If that proposition were compared with the facts, it would be found to conform, or correspond, to them'. Besides the problems involved in stating precisely what it means to compare a proposition with facts, this simple rendition of the Correspondence Theory of Truth is superficial to the point of virtually begging the question. Peirce does not reject the Correspondence Theory, but he points out:

That truth is the correspondence of a representation with its object is, as Kant says, merely the nominal definition of it. Truth belongs exclusively to propositions. A proposition has a subject (or set of subjects) and a predicate. The subject is a sign; the predicate is a sign; and the proposition is a sign that the predicate is a sign of that of which the subject is a sign. If it be so, it is true. But what does this correspondence or reference of the sign, to its object, consist in? (5.553)

To say that truth is the correspondence of propositions to facts or to real states of affairs is then, to Peirce, rather like saying that weight is the degree of heaviness which an object possesses: there is nothing erroneous in such a definition, but it does not cut deep enough to expose the experiential significance—which, for Peirce, constitutes the fundamental meaning—of the term involved. The assertions "Proposition p is true," and "Proposition p corresponds to a real state of affairs," both require a practical consequence which would render their meaning explicit by delineating the conditions in which truth or
correspondence could be manifested and the determinable effects which such manifestation would bring about.

One way to approach the question of the meaning of 'truth'—and this is the approach which is in fact the key to the pragmatic definition of 'truth'—is to try to become clear on what it would mean for a proposition not to be true; for, after all, "To say that a proposition is certainly true means simply that it never can be found out to be false. . ." (5.142). To go on simply to aver, however, that the falsity of a proposition consists in its not corresponding to a fact or actual state of affairs would, of course, prove to be an inadequate move in the pragmatic inquiry at hand. We must, on Peirce's terms, consider the matter of what conceivable practical difference it could make to us for a proposition to be false.

In order to facilitate investigation into this latter question, let us explore some of the ramifications of a simple hypothetical situation in which the issue of falsification would take on crucial practical significance. Suppose that it is wartime and that we are given instructions on a route to take for safely conducting ourselves through a large field in a mine-infested battle area. The field is mapped out into thirty-six areas—ten of which are contiguous, would lead us from our present position to our intended destination, and, according to a local guide advising us, are completely free from mines.
If, while following the guide's advice and proceeding along the way indicated, a mine should explode beneath our feet in one of the "safe" areas, we would of course consider our advisor's assertion about the proper route to take to have been duly **falsified**: it did, among other things, not **work** for us as we had hoped, and our optimistic expectations were appropriately disappointed. On the other hand, our successfully making it to our intended destination would not have conclusively established that the guide's assertion was indeed **true**: for we might just have been lucky enough to have avoided mines which actually were located in the "safe" areas, or we might have walked right over a faulty mine which happened not to go off, etc.

Let us, therefore, reconstruct the example by supposing that our guide was formerly the master mine-layer for the enemy forces (and so possesses knowledge of the locations of all mines placed by the "other side") and that since his very recent defection to our camp we have been considering him for some very crucial intelligence operation. We now view his veracity in a more problematic light than before and desire to exhaustively check out the truthfulness of all information he has given us. If the data concerning the above-described mine-field were the only testable information he had thus far provided, we might go to such great lengths that, upon chasing the enemy forces from the immediate battle-zone, we send our demolitions experts out
to examine every inch of those ten areas he had designated as mine-free. Not only do they use all the electronic instruments of detection at their disposal, but they also proceed to dig up the whole of those ten areas to a depth past which no one would plant a mine; and after sifting every pound of dirt, they find nothing. We have then—provided our demolition team has not overlooked something—conclusively verified the defector's claim. Put into broad pragmatic terms, the meaning of his assertion "There are no mines in these ten areas," entailed the practical consequence 'If an investigation of these ten areas were pushed to its ultimate limits, no mines would be found'. The acceptance of his assertion in turn entails acceptance of that consequence and the formation of a corresponding habit of thought and action; and the disappointment of that habit would constitute the falsification of the assertion in question. ("Disappointment of a habit" may seem both a vague and peculiar phrase, but it merely refers to that which occurs when the conditions specified in the antecedent of a practical consequence held to be true are met but the anticipated occurrence of the situation described in the consequent does not obtain.) In the hypothetical situation at hand we did not initially have the relevant habit sufficiently fortified in our minds to the extent that we were willing to act as though it were a reliable one upon which to proceed—else we wouldn't have gone to
the trouble of digging up the terrain. It was our concern over whether that habit would have proved satisfactory for regulating our actions that prompted our putting the defector's assertion to the test. Regardless of our opinion as to the assertion's truth, however, we did know what the pertinent habit and its corresponding practical consequence were, and it was this knowledge that constituted for us the meaning of that assertion.

Speaking pragmatically, an assertion's meaning consists in its conceived verification, and the assertion in question was meaningful to us because we were able to conceive of the circumstances that would have verified it. The truth of the assertion, on the other hand, consisted in the fact that it really would have been verified if the investigation had been pressed far enough. But, as the example was intended to reflect, the verification of a proposition in turn consists in the non-falsification of its particular practical consequence (or consequences) when the latter is subjected to conclusively exhaustive testing. Or, to describe the matter at an even more basic level, the verifiability of a proposition consists in the ability of the belief-habit associated with that proposition never to be disappointed when so tested. Such considerations form the underpinnings of the Peircean notion of truth:
When we speak of truth and falsity, we refer to the possibility of the proposition being refuted; and this refutation (roughly speaking) takes place in but one way. Namely, an interpretant of the proposition would, if believed, produce the expectation of a certain description of percept on a certain occasion. The occasion arrives: the percept forced upon us is different. This constitutes the falsity of every proposition of which the disappointing prediction was the interpretant.

Thus, a false proposition is a proposition of which some interpretant represents that, on an occasion which it indicates, a percept will have a certain character, while the immediate perceptual judgment on that occasion is that the percept has not that character. A true proposition is a proposition belief in which would never lead to such disappointment so long as the proposition is not understood otherwise than it was intended (5.569).

In noting the pivotal role which the notion of falsifiability plays in the Peircean view of truth, I think it would not be too much of an oversimplification to observe that, although Peirce accepts the "nominal" definition of 'truth' as correspondence of a proposition with its object, his pragmatic theory of truth is at heart an empiricist's version of coherence theory centering around the ultimate compatibility of a proposition's practical consequence with all real perceptual evidence that would be brought to bear upon it under ideal conditions. A proposition is true, on Peirce's view, if it would never be "refuted" by a percept, that is, if it would cohere
with the sum of all conceivable real percepts. The deficiency inherent in false propositions is that the practical consequences—the empirical generalizations—which they entail would, if they were tested in all the relevant circumstances, fly in the face of experiential data; their falsity (and consequent inadequacy to serve as rules for conduct) would be demonstrated through a sort of grand-scale empirical *reductio ad absurdum*. True propositions, on the other hand, would (by definition) never lead to such contradiction. Thus, in the long run, truth will (or more precisely—would) out. Describing the matter poetically:

Truth struck to earth shall rise again  
The eternal years of God are hers  
While error...wretches in pain  
And dies amidst her worshippers  
(7.325).

To adapt a bit of Jamesian terminology, truth for Peirce amounts to universal "workability," the capacity of a belief-habit attaching to a proposition to never be disappointed by future experience.

Resting as it does upon the notion of the possibility of contradiction with experience, Peirce's conception of the nature of truth brings him to the provocative claim that all meaningless propositions are true because, after all, they would never lead to such conflict, and so could never be refuted by empirical data:
. . . Every proposition is either true or false. It is false if any proposition could be legitimately deduced from it, without any aid from false propositions, which would conflict with a direct perceptual judgment, could such be had. A proposition is true, if it is not false. Hence, an entirely meaningless form of proposition, if it be called a proposition, at all, is to be classed along with true propositions (2.327).

Whether or not this position seems intuitively distasteful in itself, I do not believe that its rejection would bear significantly upon the general acceptability of Peirce's conception of truth. To say that only meaningful propositions possess the properties of truth or falsity because only they involve practical consequences (the experiential refutability of which constitutes falsity, and non-refutability, truth) would be to alter the Peircean characterization of truth only minutely, if at all. In fact, it seems to me that the doctrine that meaningless propositions are true is more of an aberration from Peirce's views on related matters rather than a natural outgrowth of them. A proposition is defined by Peirce as a type of sign (5.553); it will be remembered, however, that a sign is really a sign only if it functions as such, that is, if it stands for something to somebody—or, in other words, when it is meaningful. A "meaningless proposition" therefore is not a sign, and so, not really a proposition. And since Peirce maintains that truth is predicable only of propositions (see p.131), it would
seem that the truth-value of "meaningless propositions" (pseudo-propositions) is a question that by rights should never come up. 4

Perhaps the most natural misunderstanding of Peirce's pragmatic conception of truth would be to construe it as representing truth to be contingent upon actual verification. On such an interpretation he might be understood to be saying that a proposition is true as long as it 'works' (i.e., is consistent with perceptual judgment) and becomes false only when it ceases to work. If this were really Peirce's view, then on his terms, to return to the first phase of our mine-field example of previous pages, the proposition to the effect that there are no mines in certain specified areas would be true until resoundingly falsified by the explosion beneath our feet. In reality, nothing could be further from Peirce's position than a claim such as this. To Peirce, the truth of any proposition resides in the fact that that proposition would be verified under idealized circumstances, that is, if all the tests which could conceivably falsify that proposition were to be employed and their results properly understood and none of those results would be such as to falsify it. On such a view, a proposition's truth has nothing whatsoever to do with such questions as whether that proposition has in fact been verified or whether it will ever be technically possible to verify it. Of course,
if the proposition has 'worked' in all the testing situations to which it has been exposed, it might indeed be rational to tentatively accept it as true; but acceptance of a proposition as being true and the actual truth of that proposition are, on the Peircean analysis, two quite different matters.

A related consideration to bear in mind with respect to Peirce's pragmatic conception of truth is that it does not pretend to present us with a readily applicable criterion for determining which of the beliefs we might currently hold to be true are indeed veridical. It only attempts to pin down and make clear the meaning of a term which philosophers have too often employed in a highly vague and sometimes inconsistent manner. Peirce's position is perfectly compatible with the possibility of a rational person's accepting and understanding the pragmatic notion of truth and yet never arriving at the ascertainment of any actual truths (except perhaps for whatever truths are involved in understanding that notion). An individual's beliefs may all 'work'—never be disappointed by experience—but all be false, the lack of recognition of their falsity perhaps due to failure to encounter the would-be results of all relevant tests or to misinterpretation of those results which have been encountered. Peirce's views on such issues are reflected dramatically in his doctrine of fallibilism, a doctrine which is entailed by the Peircean
conceptions of truth and reality and which will be treated in the next chapter of this study.

Now that we have seen some of the essential features of Peirce's pragmatic notion of truth, before attempting to plumb the depths of that notion any further it might be advisable to pause for some reflection on the capsular definition cited at the outset (p. 3) of this paper: "The opinion which is fated to be ultimately agreed to by all who investigate, is what we mean by the truth. . ." (5.407). Analysis of Peircean "fate" and the matter of "all who investigate" is, I think, better left untried for a few more pages, but a few comments about Peirce's employment of the term "opinion" to designate the ultimate repository of truth now seem in order. Inasmuch as we sometimes think of truth as that in terms of which opinions should be evaluated it might appear that Peirce is propounding a fallacious equation of the thing judged (opinion) with the very standard (truth) by which it is to be judged. It might also seem that in characterizing truth as a species of opinion Peirce is contradicting his own stated position that "truth belongs exclusively to propositions" (5.553). The latter difficulty can be smoothed away, however, by noting the very broad definition which Peirce assigns to the word 'proposition':

A proposition is a sign which separately indicates its object. Thus, a portrait with the name of the original below it is
a proposition. It asserts that if anybody looks at it, he can form a reasonably correct idea of how the original looked. A sign is only a sign in actu by virtue of its receiving an interpretation, that is, by virtue of its determining another sign of the same object. This is as true of mental judgments as it is of external signs . . . . And we speak of believing in a proposition, having in mind an entire collection of equivalent propositions with their partial interpretants. Thus, two persons are said to have the same proposition in mind. The interpretant of a proposition is itself a proposition. Any necessary inference from a proposition is an interpretant of it (5.569).

As to the other problem just mentioned—the equation of thing-judged with standard-of-judgment—Peirce speaks to this matter (in fine pragmatic fashion) by expressing his disdain for the reification of "truth" into something over and above that of which it is predicable:

You only puzzle yourself by talking of this metaphysical "truth" and metaphysical "falsity," that you know nothing about. All you have any dealings with are your doubts and beliefs, with the course of life that forces new beliefs upon you and gives you power to doubt old beliefs. If your terms "truth" and "falsity" are taken in such senses as to be definable in terms of doubt and belief and the course of experience (as for example they would be, if you were to define the "truth" as that to a belief in which belief would tend if it were to tend indefinitely toward absolute fixity), well and good: in that case, you are only talking about doubt and belief. But if by truth and falsity you mean something not definable in terms of doubt and belief in any way, then you are talking of entities of whose existence you can know nothing, and which Ockham's razor would clean shave off (5.416).
For Peirce, as we have seen, all propositions are either true or false, and their truth or falsity consists merely in their capacity to be verified or falsified in the course of an ideally executed investigation. To speak of a limit toward which rational inquiry would, under idealized circumstances, tend, is however to make a presupposition of something beyond truth itself. If truth consists in *ultimate opinion*, it would seem that there must be some intervening factor which assures that opinion of its ultimateness, that is, which guides it toward "absolute fixity." In the Peircean scheme of things, that factor, not surprisingly, is *reality*; and an accounting of the internal logic of that concept is required if the pragmatic conception of truth—and pragmatism itself, even if viewed as simply a criterion of meaning—*is to be seen as self-consistent, acceptable, and unavoidable.*

At first bite, Peirce's definition of 'reality' might be even more unpalatable to his reader than his unorthodox definition of 'truth':

> The real...is that which, sooner or later, information and reasoning would finally result in, and which is therefore independent of the vagaries of me and you. Thus, the very origin of the conception of reality shows that this conception essentially involves the notion of a COMMUNITY, without definite limits, and capable of a definite increase of knowledge (5.311).
What anything really is, is what it may finally come to be known to be in the ideal state of complete information, so that reality depends on the ultimate decision of the community. . . (5.316).

Upon sufficient consideration one might be inclined to concede that all we really mean by speaking of the "truth" of a proposition is something like its ultimate verifiability, or universal workability, but to make the notion of reality itself somehow dependent upon the decision of a community of minds might seem to be carrying epistemological anthropomorphizing a bit too far. After all (so the objection might run), much as we would hope that scientific investigation will ultimately arrive at so advanced a stage that it is able to describe with confidence the actual structure of reality, we must nevertheless admit the logical possibility that the true nature of the real world and of the objects of which it is comprised lies eternally beyond the grasp of human intellection. It might not only seem possible, but necessary that such is the case; for, if we concede the empiricist assumption that all our dealings with things outside our minds occur through the mediation of sense, our conception of the world of real objects would appear to be forever limited by the data disclosed in perception. As Kant put it:

What may be the nature of objects considered as things in themselves and without reference to the receptivity of our sensibility is quite unknown to us. We know nothing more than our own mode of
perceiving them, which is peculiar to us, and which, though not of necessity pertaining to every animated being, is so to the whole human race. With this alone we have to do. . . . Supposing that we should carry our empirical intuition even to the very highest degree of clearness, we should not thereby advance one step nearer to a knowledge of the constitution of objects as things in themselves. For we could only, at best, arrive at a complete cognition of our own mode of intuition, that is, of our sensibility. . . . While the question -- 'What are objects considered as things in themselves?' remains unanswerable even after the most thorough examination of the phenomenal world. 5

Not only might nature have endowed us with sensory apparatus far different from that which we do possess, but the very notion of a sense datum involves a relation between a subject and an object—while the object in itself (so this view goes) involves no such relation to a perceiving subject. Through the act of perception we condition reality according to the nature of our senses. Unconditioned reality then—reality in itself—seems by virtue of the dyadic character of perception to lie beyond the cognitive grasp of human beings, even a community of perfectly rational investigators possessed of all the technical resources of which we can conceive and an eternity at their disposal in which to carry out their investigations. Just the fact that we can speak meaningfully of things-in-themselves would seem to expose the inadequacy of Peirce's pragmatic definition of reality,
for it strongly implies that when we use the term 'real' we can and do mean to refer to something that is not definable in terms of a relation to human thought. If this be so, then it would also seem that the props are knocked out from under the pragmatic conception of truth; for if there be at least the logical possibility of an incognizable reality, then it would follow that there could be truths concerning that reality which would by definition be unverifiable. And if that be so, it would further appear to be the case that the pragmatic theory of meaning itself falters, resting as it does upon the notion of conceived verifiability. Thus (to anticipate one of the conclusions to be developed in this chapter) we see the logical dependence of the Peircean views of truth and meaning upon the pragmatic definition of reality, and we also see that the viability of all three of these conceptions is contingent upon the refutability of the Kantian doctrine of things-in-themselves.

In proceeding to explore these considerations, a few preliminary comments concerning the nature of the "community" referred to in Peirce's pragmatic definition of reality are warranted in order to avoid needless ambiguities. In putting forth that definition, Peirce is saying that all we can consistently mean by the term 'reality' is that which would constitute the object of the ultimate opinion of an ideal community of investigators.
The conception of such a community represents, or at least approximates, what Peirce (after Kant) would call a "regulative principle," i.e., "an intellectual hope" (1.405)\(^6\) whose postulation serves to clarify that which, for Peirce, is irrefragably entailed by--and so contained in--our notion of the real. The actual existence or non-existence of such a community would not affect our meaning when we refer to 'the real'. Therefore, we must not allow ourselves to become sidetracked into an enumeration of the problems which could possibly keep an investigation from its appointed rendezvous with truth. The Peircean 'community' is an ideal to the extent that, as conceived, it does not consist of a species of mental defectives, it is not destroyed by some cataclysm, etc. Interestingly enough though, it need not be the case (and Peirce never suggests) that the conceived community is ideal in the sense of being comprised of, for example, a group of unerring geniuses. Given Peirce's confidence in the capacity of the abductive/inductive/deductive process\(^7\) for the apprehension of truth, the community's sedulous adherence to that process, properly carried out, would be bound to (or "destined" to) uncover the nature of reality:

That is real which has such and such characters, whether anybody thinks it to have those characters or not. At any rate, that is the sense in which the pragmatist uses the word. Now, just as conduct controlled by ethical reason tends toward fixing certain habits
of conduct, the nature of which... does not depend upon any accidental circumstances, and in that sense may be said to be destined; so, thought, controlled by a rational experimental logic, tends to the fixation of certain opinions, equally destined, the nature of which will be the same in the end, however the perversity of thought of whole generations may cause the postponement of the ultimate fixation. If this be so, as every man of us virtually assumes that it is, in regard to each matter the truth of which he seriously discusses, then, according to the adopted definition of "real," the state of things which will be believed in that ultimate opinion is real (5.430).

Since the investigation is idealized in the senses described, we should not interpret Peirce to be implying that reality and truth are "made" by any actual investigation nor as meaning that any views purporting to describe reality which are held (presently or in the future) by any or all the rational creatures in the universe are correct. The structure of an atom, for instance, is what it is regardless of how scientists view it; but if they would pursue the investigation of its structure to the ideal limit, the opinion which they finally arrive at would describe a part of reality as it actually is.

Now, assuming that these preliminary considerations concerning the nature of the Peircean community and its investigations are sufficiently clear, it seems that Peirce's definition of reality must be able to surmount two major challenges. First, it must somehow be
demonstrated that the postulation of an unknowable reality of things-in-themselves, alluded to on page 145, fails as an effective barrier to the acceptance of a definition of reality stated in terms of the conclusions of an ideal investigation. Secondly, it must be shown that the assertion 'That which is represented in (i.e., forms the object of) the ultimate opinion of the ideal community is real' is not merely a statement of a trivial truth entailed by our notion of reality, but that it explicates the whole of our conception of what it means for something to be real. We shall now turn to the first of these two issues.

Peirce's attacks upon the Kantian doctrine of things-in-themselves appear with some frequency among the Collected Papers. Couched as these attacks are, in what Peirce would call logical (rather than metaphysical) terms, it might seem surprising to some of his readers that he does not wheel forth his great logical engine, the pragmatic maxim, to conclusively devastate these potentially troublesome entities. It would, after all, be an easy enough matter to show that notions of things-in-themselves involve no "effects which might conceivably have practical bearings," no "practical consequences," and so are at best "vague shadows of ideas," i.e., meaningless pseudo-concepts. The fact that Peirce does not take such a tack is, I believe, highly suggestive of a conscious recognition that the pragmatic criterion of meaning
presupposes the dissolution of the Kantian view and so
would be involved in something of a logical circle were it
to be employed as the ultimate basis of an argument
against that view. This is not to say, however, that when
speaking to the question of things-in-themselves Peirce
does not utilize considerations that bear strongly upon
the character of the pragmatic criterion of meaning. Just
how strongly they bear will, I hope, become more evident
in the following pages.

Perhaps Peirce's most comprehensive attempt at refut-
ing the doctrine of incognizable things-in-themselves
appears in the early article entitled "Questions Concern-
ing Certain Faculties Claimed For Man." Commencing his
analysis with what appears to be a hackneyed bit of em-
piricist dogma, to the effect that we can have no con-
ception of a thing-in-itself because "nothing of that sort
occurs in experience" (5.257), Peirce's argumentation goes
on to take a somewhat more sophisticated and idiosyncratic
turn:

If I think "white," I will not go so far
as Berkeley and say that I think of a per-
son seeing, but I will say that what I
think is of the nature of a cognition, and
so of anything else which can be experienced.
Consequently, the highest concept which
can be reached by abstractions from
judgments of experience—and therefore, the
highest concept which can be reached at
all—is the concept of something of the
nature of a cognition. Not, then, or what
is other than, if a concept, is a concept
of the cognizable. Hence, not-cognizable, if a concept, is a concept of the form "A, not-A," and is, at least, self-contradictory. Thus, ignorance and error can only be conceived as correlative to a real knowledge and truth, which latter are of the nature of cognitions. Over against any cognition, there is an unknown but knowable reality; but over against all possible cognition, there is only the self-contradictory. In short, cognizability (in its widest sense) and being are not merely metaphysically the same, but are synonymous terms (5.257).

I think the content of this passage--particularly the intriguing last sentence--warrants some clarification. To facilitate such clarification, let us consider some examples of possible meanings attaching to the phrase "things in themselves."

Let us suppose that all the sentient beings in the universe had been born without the faculty of sight. Laboring as they are under such an experiential handicap, might it not correctly be said of these beings that when they come into contact with the objects of the real world they are not fully experiencing those objects as they really are? After all, the various objects collectively possess all the colors of the spectrum, yet no one has the ability to experience any of those colors or even to know what color-qualities are. Thus, it might seem, the natures of the real objects--the things-in-themselves--would, to a degree, be incognizable. Such a view of the matter can immediately be seen to be problematic, however, for if we
are referring to those color-qualities as color-qualities, then at least we—whomever we are—must know what the experience of those qualities is like. Hence, the true natures of objects are not really unknowable, but merely unknown (accidentally, as it were) to others. We can even imagine that those other beings might eventually reach such an advanced stage of technology that they would discover instruments which would function for them exactly the same way as our eyes do for us. Though the likelihood of this development might be debated, its logical possibility is sufficient to neutralize the 'incognizability'-factor putatively involved in the example. Perhaps, though, the problem lies in the way in which we set up the example. Let us now amend it and be sure to include ourselves in the class of sentient beings under discussion by hypothesizing a sixth sense which all of us lack. The absence of this extra sense would keep us from a full understanding of the character of real objects because those objects would possess qualities which must go unperceived. Under such a supposition, the possibility of a reality which is not entirely knowable might appear to be secured. However, in postulating the 'sixth sense' it seems that we must concede that if the perception of certain qualities is dependent upon the possession of that sense, then we are still not talking about qualities in the object which would remain forever unknown to an ideal community of
investigators afforded with an eternity in which to develop a means of apprehending the qualities in question. Once again, we find ourselves to have been referring to an unknown, but knowable, level of reality.

Of course, the above examples do not speak directly to the Kantian sense of 'thing-in-itself' confronted on page 144 of this study. Therefore, let us consider the view that no matter how advanced intelligent beings might become, their perception (and so their knowledge) of objects will always involve an obstructive relation between subject and object, perceiver and perceived, knower and the known; that is, that there will always be a conditioning of objects through the medium of the senses, and since the objects in themselves involve no cognitive relation—they simply are—to condition them in any way is to be dealing with something other than the real objects-in-themselves. Such a view does not hold up very well under scrutiny if we acknowledge the soundness of the following points. First of all, a thing-in-itself must be conceivable; that is, the expression "thing-in-itself" must have some determinate meaning for us if its postulation is to be accepted as a working hypothesis. Secondly, as Kant himself pointed out, to conceive of an object is to conceive of it as existing:

...Because existence belongs necessarily to the object of the conception (that is, under the condition of my positing this
thing as given), the existence of the thing is also posited necessarily... merely because its existence has been cogitated in the conception... Annihilate its existence in thought, and you annihilate the thing itself with all its predicates.

We can indeed conceive of objects which we assume have no existence, but our discrete conceptions of such objects are not conceptions of them as not existing; in the latter operation we are merely conceiving of certain concretions of properties and postulating that such concretions do not currently obtain anywhere in the universe. When we mentally conjure up a unicorn, for instance, we conceive of it as it would exist, not as it would not exist. (To use a visual analogy, if I were commissioned to do a portrait of a unicorn as it would look without existence, I could merely point to an empty canvas and rightfully collect my fee.) Conversely, a thing-in-itself, if it is to possess existential status, must be a concretion of some properties, whatever those properties might be. Translating this last consideration into Peircean phaneroscopic terms, existence, as sustained actuality, is primarily an affair of secondness, the category of reaction—"existence means reaction with the environment, and so is a dynamic character" (5.503)—and an existent object is a "cluster" of such reactions, or properties (4.157-159). And if we do not contest this characterization of 'existence', it appears that we must
embrace a neo-Berkeleyian species of phenomenalism which denies the intelligibility of the notion of existent Kantian 'things-in-themselves':

Existence is that mode of being which lies in opposition to another. To say that a table exists is to say that it is hard, heavy, opaque, resonant, that is, produces immediate effects upon the senses, and also that it produces purely physical effects, attracts the earth (that is, is heavy), dynamically reacts against other things (that is, has inertia), resists pressure (that is, is elastic), has a definite capacity for heat, etc. To say there is a phantom table by the side of it incapable of affecting any senses or of producing any physical effects whatever, is to speak of an imaginary table. A thing without oppositions ipso facto does not exist (1.457).

All such "oppositions" are, in principle at least, knowable; and so reality, on the Peircean view, might aptly be described (to rephrase Mill's famous line) as 'a permanent possibility of cognition'. This is precisely, however, what Kant's 'things-in-themselves' are not. To speak of objects which "exist" in any sense other than their fitness to function in the cognitive relation is to speak of objects which possess no properties ("oppositions"); and to so speak is, to Peirce, to literally speak of nothing. Thus, we see the grounds for his equation of cognizability and being. If the phrase "thing in itself" is to be meaningfully and usefully employed in a discussion of the concept of "reality," it would seem that its proper use
is merely to mark off the real as it would be apprehended in correct and comprehensive cognition. This point is rather clearly and succinctly articulated in an essay by F. E. Abbot (an essay to which Peirce gave unusually enthusiastic endorsement):

The only utility in retaining the distinction... (between 'noumena' and 'phenomena')... at all is to mark the distinction between complete and incomplete knowledge—noumena being taken to denote things-in-themselves as they exist in all the complexity of their objective attributes and relations, and phenomena being taken to denote these same things-in-themselves so far only as they are known in their objective attributes and relations.

As we shall see very shortly, it is to flesh out (or give 'pragmatic significance' to) the concept of 'complete knowledge' that Peirce infuses the pivotally important notion of the 'unlimited community of investigators' into his joint definition of 'truth' and 'reality'.

As the discussion of the doctrine of the Ding an sich was intended to reflect, the Peircean view is that if something is real it is cognizable: and if something is cognizable, it follows that a sufficiently prolonged investigation by an ideal community of inquirers would result in a veridical cognition of that something. (This last seems an innocent enough contention if we build enough into the 'ideality' of the community.) What remains to be shown then is the cogency involved in Peirce's
claim that his pragmatic definition of 'reality' explication the whole of our meaning of that term—or, to pose the matter in more pragmatistic phrasing, that the definition exhausts the full range of "conceived effects" attaching to the meaning of 'the real'.

A moment ago I characterized the Peircean epistemological perspective as a "neo-Berkeleyian species of phenomenalism." Certainly the resemblance to Berkeleyian phenomenalism evidences itself in the "How to Make Our Ideas Clear" article, Peirce equating the "whole conception of an object" with the totality of conceived "sensible effects" of the object. In an earlier article, Peirce makes the even bolder assertion that "the phenomenal manifestation of a substance is the substance" (5.313). In a 1901 review of an edition of The Works of George Berkeley, Peirce acknowledges the debt which philosophy in general, and pragmatism in particular, owe to the Bishop of Cloyne:

Berkeley is, in truth, far better entitled to be considered the father of all modern philosophy than is Kant. It was he, not Kant, who first produced an Erkenntnisstheorie, or "principles of human knowledge," which was for the most part correct in its positive assertions. It was he, more than any other single philosopher, who should be regarded as the author of that method of modern "pragmatism"—i.e., the definition, or interpretation, of conceptions by their issues—which equally distinguished the
thought of Kant, but which neither philosopher grasped clearly enough to formulate it in general terms.\textsuperscript{13}

In that same review, however, Peirce alludes to a consideration which distinguishes his own brand of phenomenalism from that of Berkeley:

One of the greatest weaknesses of Berkeley is shared by Kant in a lesser degree. We mean his Ockhamism, or refusal to acknowledge any being \textit{in futuro}, or any mode of being whatever except that of individual existence. Even the Ockhamist Stuart Mill defines matter as a "permanent possibility" of sensation; but, for the more consistent Ockhamist, Berkeley, possibility is absolute nonentity: material objects must, when men have them not in view, be all along actually present to the Divine mind, or they would collapse into utter nothingness.\textsuperscript{14}

It is Peirce's recognition of the importance of the notions of possibility and "being \textit{in futuro}" that exposes the oversimplification involved in his own brash identification (thirty-three years earlier) of the "phenomenal manifestation of the substance" with the substance. Looking back on our earlier discussions of the pragmatic theory of meaning, we remember that, to Peirce, the meaning of any concept (and so, the meaning of any concept designating any real object) is ultimately expressible as a practical consequence, or series of such consequences, which in turn have reference to what \textit{would} be expected to transpire upon the occasion of certain circumstances, that is, upon the occasion of certain \textit{possible} events and modes of behavior
in the future. Thus, for Peirce, all meaning, all thought, is implicitly and ineluctably grounded in a presumption of the reality of possibility, futurity, and generality:

The meaning of a proposition is itself a proposition. Indeed, it is no other than the very proposition of which it is the meaning: it is a translation of it. But of the myriads of forms into which a proposition may be translated, what is that one which is to be called its very meaning? It is, according to the pragmaticist, that form in which the proposition becomes applicable to human conduct, not in these or those special circumstances, nor when one entertains this or that special design, but that form which is most directly applicable to self-control under every situation, and to every purpose. This is why he locates the meaning in future time; for future conduct is the only conduct that is subject to self-control. But in order that that form of the proposition which is to be taken as its meaning should be applicable to every situation and to every purpose upon which the proposition has any bearing, it must be simply the general description of all the experimental phenomena which the assertion of the proposition virtually predicts (5.427). 15

And earlier in this chapter we saw that, from the pragmatic point of view, the truth of any conception consists in its generalized capacity to never be falsified by the totality of possible future experience. By falling back on the notions of possibility, futurity, and particularly generality, Peirce is able to create the epistemological 'gap' needed to distinguish between reality as perceived or cognized and reality as it is—or in the terminology of F. E. Abbot, between phenomena and noumena, between
incomplete and complete knowledge. Of those three notions, generality seems to be the most crucial, if for no other reason that that, on the Peircean treatment, it includes the other two as sub-elements. Much fine scholarship has centered around Peirce’s views on generality and his personal variety of Scholastic Realism. For our own immediate purposes (that is, to arrive at a fuller understanding of Peirce’s definition of ‘the real’ and to divine the interrelationships existing among the Peircean conceptions of 'meaning', 'truth', and 'reality') I think we can legitimately bypass some well-trodden ground by restricting our discussion of Peircean generality (for the time being) to the distinctions appearing in the following paragraphs.

When Peirce speaks of "the general kinds of experimental phenomena" which constitute the basis of all intellectual meaning, when he says that "a prediction is essentially of a general nature, and cannot ever be completely fulfilled" (1.26), or when he says the following:

A purpose is essentially general, and so is a way of acting; and a conditional proposition is a proposition about a universe of possibility. At the same time, the conditional proposition refers only to possible individual actions . . . . (An) endless series of experiences, each entirely consistent with those that precede it, cannot itself be experienced (as such endless series), but involves a first does of ideality, or generality (5.528).
there is some ambiguity in his statements due to the fact
that on his characterizations of generality there seems
to be more than one type or level of generality operative
in the meaning of all propositions. I think we can use-
fully discern three such levels, which I shall somewhat
arbitrarily label, respectively, \textit{internal} generality, \textit{ex-
ternal} generality, and \textit{operational} generality. Equating
generality with \textit{continuity} (see p. 18 and p. 35), Peirce
says: "The idea of a general involves the idea of
possible variations which no multitude of existent things
can exhaust" (5.103). All three levels of generality
referred to seem to fit this characterization.

(a) \textbf{Internal Generality.} To Peirce, time and space
are both true continua, a continuum being defined as
"something whose possibilities of determination no multi-
tude of individuals can exhaust" (6.170). On his view,
y any segment of a true continuum is itself a continuum;

\[
\ldots\text{No collection of points, each dis-
tinct from every other, can make up a}
\text{line, no matter what relation may sub-
sist between them; and therefore whatever}
\text{multitude of points be placed upon a line,}
\text{they leave room for the same multitude}
\text{that there was room for on the line before}
\text{placing any points upon it. This would}
\text{generally be the case if there were room}
\text{only for the denumerable multitude of}
\text{points upon the line. As long as there}
\text{is certainly room for the first denumerable}
\text{multitude, no denumeral collection can be}
\text{so placed as to diminish the room, even}
\text{if, as my opponents seem to think, the}
\]
line is composed of actual determinate points. But in my view the unoccupied points of a line are mere possibilities of points, and as such are not subject to the law of contradiction, for what merely can be may also not be. And therefore there is no cutting down of the possibility merely by some possibility having been actualized (4.460).

Now, if we grant that any real event or any state of a real object consumes a span of time—that is, a segment of the temporal continuum—it would seem to follow that any meaningful description of such a state or event, no matter how specific and precise, implicitly has reference to an infinite series. For example, if I say, "That diamond was hard for the ten seconds it existed," my assertion entails the proposition that the diamond was hard every millisecond of that ten seconds, that it was hard every thousandth of every millisecond during that period, etc. If the original assertion is viewed (as, on pragmatic grounds, it must be) as averring that every conceivable test that could be run during every instant of the diamond's existence would have confirmed the diamond's hardness, then—since however many 'instants' might be specified for the overall testing procedure, more instants could be specified—the potential number of tests requisite to conclusively verify the assertion would be infinite.

(b) **External Generality.** If the practical consequence or consequences which comprise the meaning of a truth-claim specifies a testing procedure pertinent to conceivable
future experience, then that truth-claim must purport to predict that no matter how often the test or tests in question are conducted they will always yield the supposed results:

The most insignificant of general ideas always involves conditional predictions or requires for its fulfillment that events should come to pass, and all that ever can have come to pass must fall short of completely fulfilling its requirements. A little example will serve to illustrate what I am saying. Take any general term whatever. I say of a stone that it is hard. That means that so long as the stone remains hard, every essay to scratch it by the moderate pressure of a knife will surely fail. To call the stone hard is to predict that no matter how often you try the experiment, it will fail every time. That innumerable series of conditional predictions is involved in the meaning of this lowly adjective (1.615).

Although common sense might intervene in the case of an actual verification procedure and dictate an end to "needlessly redundant" testing, nevertheless the meaning of any proposition, on this view, entails that endlessly repetitive testing would never yield a finding which ran counter to the results implicitly predicted by that proposition.

(c) Operational Generality. Up until now, when referring to the practical consequence or consequences entailed by a proposition, I have alluded to them as though there were a definite determinate set of such consequences
corresponding to any given proposition. Although it was expedient for purposes of previous exposition to do so, and although Peirce himself at times seems to imply that such is the case, it is now time to confront the fact that Peirce's actual view is that the number of practical consequences, or validational operations, accruing to a proposition is potentially limitless. I am not referring here to the point that the number of conceivable test-instances involved in the meaning of a proposition are without limit—a point entailed by considerations of what I have called "internal" and "external" generality—but rather that the types of such tests are necessarily indefinite and without limit. The immediate upshot of this latter point, in Peirce's own provocative words, is that "we can never know precisely what we mean by any description whatever" (7.119). This certainly seems a most peculiar claim to be espoused by a man whose personal fame resulted largely from the development of a formula for "how to make our ideas clear," but the following quotation (extracted from a fascinating passage in which Peirce draws a lengthy analogy between words and human beings) should serve to illustrate what he is getting at:

Perception is the possibility of acquiring information, of meaning more; now a word may learn. How much more the word electricity means now than it did in the days of Franklin; how much more the term planet means now than it did in the time of Hipparchus. These words have acquired
information; just as a man's thought does by further perception. But is there not a difference, since a man makes the word and the word means nothing which some man has not made it mean and that only to that man? This is true; but since man can think only by means of words or other external symbols, words might only by means of words or other external symbols, words might turn round and say, You mean nothing which we have not taught you and then only so far as you address some word as the interpretant of your thought. In fact, therefore, men and words reciprocally educate each other; each increase of a man's information is at the same time the increase of a word's information and vice versa (7.587).

I interpret Peirce to be saying here that the set of types of operations which forms a word's (or concept's) meaning is always theoretically subject to future expansion or contraction as we learn more about the nature of the referent of that word. If indeed such be Peirce's view, it seems to come very close to anticipating Hilary Putnam's useful notion of "law-cluster concepts," i.e., that there are concepts whose respective meanings are constituted by clusters of laws "which determine the identity" of each such concept:

The concept 'energy' is an excellent example of a law-cluster concept. It enters into a great many laws. It plays a great many roles, and these laws and inference roles constitute its meaning collectively, not individually. I want to suggest that most of the terms in highly developed science are law-cluster concepts. . . . (In). . . general, any one law can be abandoned without destroying the identity of the law-cluster concept involved, just as a man can be
irrational from birth, or can have a growth of feathers all over his body, without ceasing to be a man.

...In the case of a law-cluster term such as 'energy', any one law, even a law that was felt to be definitional or stipulative in character, can be abandoned, and we feel that the identity of the concept has, in a certain respect, remained.16

And if we take the liberty of employing Putnam's notion to describe the Peircean view, I think it can be said that, to Peirce, any concept used to describe reality is a law-cluster concept and therefore there can be no way to insure that such a concept's determinateness of meaning will not be undermined by future discoveries and insights concerning the concept's designates. Considering, for example, the relatively mundane judgment that a certain person once lived, upon analysis we can see that the concept of human existence involved in that judgment is open-ended with respect to the "sensible effects," or "practical consequences," of "operations" which are at once both entailments of that judgment and confirmational evidence supporting that judgment:

Now, the facts which serve as grounds for our belief in the historic reality of Napolean are not by any means necessarily the only kind of facts which are explained by his existence. It may be that, at the time of his career, events were being recorded in some way not now dreamed of, that some ingenuous creature on a neighboring planet was photographing the earth, and that these pictures on a sufficiently large scale may some time come into our possession,
or that some mirror upon a distant star
will, when the light reaches it, reflect
the whole story back to earth. Never mind
how improbable these suppositions are;
everything which happens is infinitely
improbable. I am not saying that these
things are likely to occur, but that some
effect of Napoleon's existence which now
seem impossible is certain nevertheless
to be brought about. The hypothesis... (that Napoleon existed)... asserts that
such facts, when they do occur, will be of
a nature to confirm, and not to refute, the
existence of the man (2.642).

We will examine the matter of what I here choose to
label "operational generality" in further depth in subse-
quent chapters. Suffice it to say for the present that if
all concepts possess operational generality, no finite
number of tests of the putatively veridical application of
any concept confers absolute assurance that some as yet
undetermined type of test (i.e., one involving a practical
consequence or operation that would be grafted onto the
meaning of the concept at some time in the future) might
not result in the falsification of that application.

All three of the above-described species of generality
appear to involve the conceived testing of a concept's
applicability at levels that lie beyond the capability of
any actual human individual. And since the meaning of any
concept is, from the pragmatic standpoint, the conceived
testing of its applicability, it might seem natural to
conclude that it is simply the natural limitations implied
in our notion of an individual that leads Peirce to define
the real as that which would form the object of the opinion of an unlimited community of minds which had pursued its investigation sufficiently far. (Of course, the expression "sufficiently far" is itself highly problematic in this context inasmuch as the Peircean view of generality seems to entail that no specifiable point in the investigation is ever quite far enough; but this is an issue with which we shall grapple in a later chapter.) In other words, it might be thought that the function of the community in Peirce's definition of the real is to match a large enough number of 'testers' against the need for the conceived performance of an indefinitely large number of tests that would conclusively establish an opinion as true and its "object" as real. Peirce himself, as in the following passage, sometimes speaks as though such were the case:

\[\ldots(\text{Death}).\ldots\text{makes the number of our risks, of our inferences, finite, and so makes their mean result uncertain. The very idea of probability and of reasoning rests on the assumption that this number is indefinitely great}.\ldots\text{It seems to me that we are driven to this, that logicality inexorably requires that our interests shall not be limited}. \text{They must not stop at our own fate, but must embrace the whole community. This community, again, must not be limited, but must extend to all races of beings with whom we can come into immediate or mediate intellectual relation. It must reach, however vaguely, beyond this geological epoch, beyond all bounds}.\ldots\text{Logic is rooted in the social principle (2.654).}\]

On the other hand, inasmuch as we are dealing (on Peirce's
own terms) with the limits of conceivability, rather than actuality, it seems to me that this cannot really be the key reason behind Peirce's belief that the notion of community is needed in order to explicate the whole of our conception of 'the real'. We could, for instance, define the real as "that which would form the object of the final opinion of an ideal individual (or God)," building into the 'ideality' of that individual the capacity to execute and interpret an unlimited number of testing experiences. The chief defect in such a definition, however, is that it ignores the fact that the real is the object of an opinion (i.e., true opinion) which would never be falsified by any experience. To restrict the designation "real" to items represented in the opinion of any individual or predetermined number of individuals, however idealized that individual or those individuals might be, would be to arbitrarily limit the range of possible experience under consideration and so, from the pragmatic point of view, render that designation peculiarly inapt:

One man's experience is nothing, if it stands alone. If he sees what others cannot, we call it hallucination. It is not "my" experience, but "our" experience that has to be thought of; and this "us" has indefinite possibilities (5.402, n.2). (Italics mine.)

The italicized clause in the passage cited is of crucial importance, for it signals Peirce's recognition of the essentially public character of the real. Into that
passage we could just as well substitute the descriptions "Any determinate number of ideal individuals' experience" or "God's experience"; the conclusion to be drawn would be the same: if what is experienced could not, under appropriate specifiable circumstances, be experienced by any intelligent being, then the object of that experience is, by definition, private, hallucinatory, and unreal. Conversely, Reality is that mode of being by virtue of which the real thing is as it is, irrespectively of what any mind or any definite collection of minds may represent it to be (5.565).

Furthermore, Peirce sees his insistence upon the "publicness-factor" as the distinguishing feature of reality as following straightforwardly from the original, historical definition of 'the real':

For reális and realítas are not ancient words. They were invented to be terms of philosophy in the thirteenth century, and the meaning they were intended to express is perfectly clear. That is real which has such and such characters, whether anybody thinks it to have those characters or not (5.430).

"Real" is a word invented in the thirteenth century to signify having Properties, i.e., characters sufficing to identify their subject, and possessing these whether they be anywise attributed to it by any single man or group of men, or not. Thus, the substance of a dream is not Real, since it was such as it was, merely in that a dreamer so dreamed it; but the fact of the dream is Real, if it was dreamed; since if so, its date, the name of the dreamer, etc. make up a set of circumstances sufficient
to distinguish it from all other events, and these belong to it, i.e., would be true if predicated of it, whether A, B, or C actually ascertains them or not (6.453).

The Peircean community of investigators, since it is unlimited (i.e., indeterminate, and idealized to the extent that its scope is subject only to the limits of conceivability) has for its range of possible experience all possible experience; as such, the 'publicness-factor' is ready-built into the objects of its cognitions, and it (the community) is theoretically fit to serve as the ultimate repository of veridical representations of the real. Assumed in this view of the matter is the pivotally important point that the indeterminateness, or "indefiniteness," of the community's composition renders it pre-eminent suitably for serving as the epistemological correlate to the open-ended generality inherent, on Peircean terms, in any and all such representations. Put another way, the opinion of the unlimited community is sufficiently elastic (i.e., adaptable to would-be data) to encompass "the whole of our conception" of the real.

By way of clarifying this last point—and to more tidily organize some of the considerations discussed in foregoing pages, hopefully thereby setting the stage for further insights into the intricate Peircean meaning/truth/reality nexus—I would like to offer (at the calculated risk of oversimplification) the following rough
reconstruction of what I take to be the general train of thought leading to Peirce's definition of reality:\textsuperscript{18}

1. To conceive of an object is to conceive of it as existing.

2. The conceived existence of an object consists wholly in a conceived concretion of properties.

3. The whole conception of an object is a conception of a concretion of properties (From 1 and 2)

4. A property of a real object is a capacity of that object to produce certain experiential effects under certain specifiable conditions.

5. To say that an object possesses a capacity to produce certain effects means that it would produce those effects upon the performance of appropriate tests.

6. To conceive of a property of a real object is to conceive of certain effects of that object which would follow from the performance of appropriate tests. (From 4 and 5)

7. The whole conception of a real object is a conception of the complete set of its would-be effects under appropriate testing. (From
3 and 6. A rough formulation of the pragmatic criterion of meaning.)

8. The conception of a real object is internally, externally, and operationally general.

9. The would-be effects of the referents of internally, externally, or operationally general conceptions are unlimited.

10. The conception of a real object is a conception of an unlimited number of effects.
    (From 8 and 9.)

11. The whole conception of a real object is a conception of its would-be effects consequent to the performance of an unlimited number of tests. (From 7 and 10.)

12. The conception of an unlimited number of possible tests involves the notion of an indeterminately large number of 'testers', i.e., an unlimited community of investigators.

13. The whole conception of a real object is a conception of what its effects would be represented to be in the final opinion of an unlimited community of investigators.
    (From 12 and 13. A fair enough version of the Peircean definition of 'the real'.)
The chief virtues of this schematized "train of thought" are that it helps to clarify some of the assumptions held in common by the pragmatic criterion of meaning (appearing as Sentence 7) with Peirce's joint definition of truth and reality, and it serves to reflect something of the logical interdependence which obtains among these core elements of his epistemology. (The word "truth" does not appear in the above schema, but, of course, it shows up disguised in its properly Peircean garb, in Sentence 13, as "the final opinion of an unlimited community of investigators.") This logical interdependence might with justice be described as the sort of relationship obtaining among the parts of a whole, the whole in this case being the rather unique phenomenalistic perspective described on pages 157 through 160. (What is so distinctive about that perspective is, as we have seen, the marriage of a hard-line phenomenalism to a view that all representations of phenomena—and so, all phenomena—are thoroughly saturated with generality.) As equipollent essential elements of that perspective, the Peircean conceptions of meaning, truth, and reality are more properly to be construed as mutually presuming each other, rather than any one of the three being derived from the other two. By way of illustration of this point, we can see that although the pragmatic criterion of meaning is employed in the above schema to help generate the full-blown definition
of the real, the Peircean conception of the real, albeit in embryonic form, is at play in Sentences 1 through 6 helping to shape the character of the criterion of meaning itself.

The pragmatic criterion of meaning's presumption of Peirce's conception of the real should scarcely surprise us by this time. Earlier in this chapter (page 146), I pointed out the incompatibility of his theory of meaning (and theory of truth) with an alternate view of reality, namely, the Kantian doctrine of 'things-in-themselves'. The reason cited for this incompatibility was the fact that the pragmatic theory of meaning depicts all intellectual meaning as necessarily involving conceived verifiability, a factor seemingly ruled out, in principle, by the Kantian view. If we probe this notion of conceived verifiability a bit deeper by employing some of the considerations brought out in Chapter II of this study, I think we will get an even better feel for why the pragmatic theory of meaning is not simply incompatible with Kant's doctrine but is presumptive of Peirce's own communal definition of reality.

In Chapter II (pages 114-116) we saw that application of the pragmatic criterion of meaning to any hypothesis involves the conceived testing of the truth of that hypothesis, and that this conceived testing is nothing other than the conceived employment of inductive methodology. Assuming the cogency of that characterization,
there are at least two (very closely related) lines of thought that reflect that the communal notion of reality is already built into, or presumed by, pragmatic criterion of meaning. First of all, we remember that the 'leading principle' of inductive inference is, on Peirce's terms, the **Uniformity of Nature** which is expressible in the 'theorem' that "there is a character peculiar to every possible group of objects" (6.414). Now, it is more than suggestive when Peirce alternately describes the ground of the validity of induction as residing in the fact of "there being any reality" (5.349). I think both expressions of the ground of inductive validity implicitly have reference to one and the same thing, namely, the Peircean communal conception of reality. This becomes increasingly apparent as we proceed to 'unpack' the contents of the 'theorem' just mentioned. Such unpacking would begin by observing that a "character" of an object or group of objects is, in Peircean terminology, a designation used to refer to predicates, qualities, relations, etc., in short, any property or characteristic of the object or objects in question. We would then go on to recall that, for Peirce, to speak of any property or characteristic of an object or set of objects is to speak of an **ascertainable** property or characteristic (in contradistinction, that is, from an unknowable "noumenal" property or characteristic). Granting Peirce that key point, we now find ourselves at a
level of reflection suspiciously similar to that involved in Sentence 4 of the schema appearing on page 172, and to sympathetically unpack Peirce's theorem further would be to follow through with the train of thought expressed in that schema until we pull out the fully-developed 'object of the final opinion of an unlimited community of investigators'.

The second route to the same destination (i.e., that the communal notion of reality is implicit in Peirce's basic conception of inductive methodology and, so, implicit in his pragmatic criterion of meaning) opens itself up by our recalling that the Peircean justification of induction is that induction "is a method which must in the long run lead up to the truth, and that, by gradual modification of the actual conclusion" (2.777). This long run, of course, is simply the indefinitely long run of test instances to be observed and evaluated by an indefinitely large (i.e., unlimited) community of investigators in their ongoing process of hypothesis construction, falsification, modification, and revision which ends finally in a settlement, or "fixation," of the community's belief. To the extent that the Peircean justification of induction is sound, this fixation of belief is "destined" (or "fated")--given that the long run would run long enough--and the object of that belief is 'the real'.

Peirce succinctly (perhaps elliptically) incorporates both of the above-described lines of thought into the
following passage:

That the rule of induction will hold good in the long run may be deduced from the principle that reality is only the object of the final opinion to which sufficient investigation would lead. That belief gradually tends to fix itself under the influence of inquiry is, indeed, one of the facts with which logic sets out (2.693).

Thus, it would seem that if the pragmatic criterion of meaning involves the conceived application of inductive methodology, it at the same time presumes the Peircean communal notion of reality in all its esoteric glory.

This conceived application of inductive methodology, with its attendant communal notion of reality, helps flesh-out to some extent Peirce's rather abstruse concept of 'concrete reasonableness'--the esthetic ideal, of which it is the duty of ethics and logic to facilitate realization--encountered in Chapter I of our study. On Peirce's view, as we have seen, "logic is rooted in the social principle" (2.654); that is, to be logical, to be rational, to be reasonable, is to "identify one's interests" with the unlimited community of investigators in their ever ongoing employment of inductive methodology. Thus anthropomorphized reasonableness becomes concretized and ceases to be an indefinable abstraction realizable only through the exercise of an occult faculty of "intuition."

Given the tacit identification with the unlimited community which buttresses the pragmatic theory of meaning, it would
not be a distortion to say that, on the Peircean view, to be pragmatic is, after all, simply to be rational.

It is hoped that considerations brought forth in this and preceding chapters pretty conclusively refute W. B. Gallie's claim that "Peirce's Pragmatism has no direct bearing on the question of truth or falsity--except that our conceptions of truth and justifiability are among those that require to be articulated by means of the Pragmatist maxim." The purpose of this study, however, has not been to beat to death a strawman constructed from an ill-considered remark of an otherwise perspicacious scholar, but rather to present something of a unified picture of Peirce's epistemology in a fashion which adequately reflects the relationship of the pragmatic theory of meaning to the other core elements of that epistemology. The picture that has been presented thus far is one in which the Peircean conceptions of meaning, truth, and reality are bound together in a complex epistemological fabric which, when viewed as whole cloth, constitutes a neo-phenomenalistic perspective deeply colored by a realist's regard for the epistemological relevance of the multifaceted notion of generality. Viewed in this light, it seems artificial to restrict the extension of the term "pragmatism" to a simple criterion of meaning. As stated earlier, the criterion of meaning presumes the whole of
which it is a part. Therefore, I would suggest (at the
risk of seeming to enter into an idle and irresolvable
form of logomachy) that pragmatism is the whole cloth, much
of which we have already seen, and some of which remains
to be unfolded in succeeding chapters. The practical value
of this way of regarding the matter is that it facilitates
a more acute understanding of, and appreciation for, the
broad and often seemingly unrelated ways (cf., e.g., page
13) in which Peirce characterizes—and makes claims for—
his doctrine of pragmatism.
NOTES TO CHAPTER III

1."Epistemological" as opposed to metaphysical. Peirce's avowedly metaphysical views on the nature of reality (which form the bulk of the content of Volume VI of the Collected Papers) may, fortunately, be largely bypassed in this and the remaining chapters of this study. Just how much of his metaphysics seeps into his epistemological (or, as he would probably describe it, logical) analysis of the concepts 'truth' and 'reality' is a question involving certain terminological issues which I do not intend to speak to--at least, not in any depth--in the study.

2.In this chapter I am employing the terms 'fact' and 'state of affairs' interchangeably--an equation which seems in accord with common usage and which, in our present context, does not appear to be obstructive to the analysis at hand, nor out of line with Peirce's own terminology. (See his definitions of "state of things" and "fact" in 5.549.) However, an interesting distinction can be drawn between the two terms: see, e.g., Alan R. White's Truth, pp. 79-87 (Garden City, Anchor Books, 1970).

3.This is an expedient oversimplification, especially with regard to the consequent which should describe the sensible effects by which a mine would be recognized.

4.Much the same way of looking at things seems to be involved when Peirce distinguishes between the 'good' and the 'bad':

...the distinction of logical goodness and badness must begin where control of the processes of cognition begins; and any object that antecedes the distinction, if it has to be named either good or bad, must be named good. For since no fault can be found with it, it must be taken at its own valuation (5.114).

Cf. 2.654, in which Peirce refers to the unlimited community (as unlimited) as a "hope."

See Chapter II of this study, particularly pages 101-102.

See, e.g., 5.265, 5.310, 5.525, 6.95, 6.419, and 7.345.


I.e., the "Introduction" to his Scientific Theism (Boston, Little, Brown, and Co., 1886), pp. 1-56.

Cf. 1.20 and 5.423.


In the same passage, Peirce also remarks:

...the pragmaticist maxim says nothing of single experiments or of single experimental phenomena (for what is conditionally true in futuro can hardly be singular), but only speaks of general kinds of experimental phenomena. Its adherent does not shrink from speaking of general objects as real, since whatever is true represents a real. Now the laws of nature are true.

The rational meaning of every proposition lies in the future. How so? (5.426)

17 The quotation is lifted from a passage dealing with matters of probability and induction, but since a theory of probability is merely a highly specialized method for exposing the character of reality (cf. 2.650) I think the quotation is relevant to the issue at hand.

18 Although, for clarity's sake, I have selected the format shown, no pretensions of "logical proof" or "formal validity" are intended. Doubtless the schema could be rendered formally valid by the introduction of additional "premisses," but nothing would really be gained thereby, and the needless prolixity would distract from the true focal points of the schema.
CHAPTER IV

THE PRAGMATIC VIEW OF HUMAN KNOWLEDGE:
FALLIBILISM AND CRITICAL COMMON-SENSISM

In the preceding chapters of this study we have been concerned with the derivation, analysis, and interrelationship of what I have referred to as the "core elements" of Peirce's epistemology, i.e., his pragmatic conceptions of meaning, truth, and reality. We have seen, among other things, that the pragmatic theory of meaning presumes the Peircean notions of truth and reality, and that all three in large measure owe their character to Peirce's views in the fields of mathematics, phaneroscopy, and logic. The term 'epistemology', however, in its most common significance is used to refer to "theory of knowledge"; and, although a philosopher's views on the characters of meaning, truth, and reality bear heavily upon his views concerning the character of human knowledge, we have thus far made little direct penetration into Peirce's theory of knowledge qua theory of knowledge.

In the present chapter I will expand upon the unifying analysis of Peirce's epistemology framed in the preceding chapters. The aim will be to evolve a somewhat more comprehensive unified picture of his epistemology by showing ways in which the two chief doctrines of his theory of

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knowledge, 'Fallibilism' and 'Critical Common-Sensism', link up with, or flow from, the above-cited "core elements" of that epistemology.

**Fallibilism**

One of the superficial ironies attaching itself to Peirce's pragmatic epistemology is that a philosopher who was so adamant in his dismissal of the Kantian notion of things-in-themselves and who construed reality to be that which is "fated" to be known by the unlimited community of investigators would, at the heart of his theory of knowledge, harbor a doctrine, dubbed 'fallibilism', which bears a certain strong resemblance to philosophical scepticism:

> Fallibilism is the doctrine that our knowledge is never absolute but always swims, as it were, in a continuum of uncertainty and of indeterminacy (1.171).

Although strict definitions of the doctrine, as such, do not abound in Peirce's writings, expressions of it do pervade his work. The following brief citations should suffice as a representative sample evidencing the lengths to which his fallibilism is carried:

> Not only is our knowledge . . . limited in scope, but it is even more important that we should thoroughly realize that the very best of what we, humanly speaking, know, we know only in an uncertain and inexact way (5.587).

> Now, as no experiential question can be answered with absolute certainty, so we can never have reason to think that any
idea will either become unshakably established or be forever exploded (7.569).

...While holding certain propositions to be each individually certain, we may and ought to think it likely that some one of them, if not more, is false (5.498).

On the whole...we cannot in any way reach perfect certitude nor exactitude. We never can be absolutely sure of anything, nor can we with any probability ascertain the exact value of any measure or general ratio (1.147).

I will not...admit that we know anything with absolute certainty. It is possible that twice two is not four (7.108).

To fully appreciate the nature and significance of Peirce's fallibilism it is helpful to notice that it is a doctrine constituting an almost paradigm realization of his methodological view that philosophy, rather than imitating traditional metaphysics' pretensions to "demonstrative proof" (1.7), ought to, like science,

...trust to the multitude and variety of its arguments than to the conclusiveness of any one. Its reasoning should not form a chain which is no stronger than its weakest link, but a cable whose fibers may be ever so slender, provided they are sufficiently numerous and intimately connected (5.265).

Indeed, the "cable" supporting fallibilism is composed of enough "fibers" stretching back to enough of Peirce's diverse areas of study that he admits that for years he used the term 'fallibilism' to refer to the main body of his ideas (1.13), although late in his career he saw fit
to subsume fallibilism under the broader, multifaceted doctrine of 'critical common-sensism' (of which we shall treat a few pages hence). Though there almost doubtless are others, I discern four main "fibers," and the areas of consideration which they involve are as follows:

1. Peirce's metaphysical doctrine of Tychism
2. The theory of signs
3. The theory of inference
4. Peirce's views concerning the nature of generality.

For ease in exposition, I will discuss them in that order.

1. Tychism. Stated most simply, Peirce's tychism is "the doctrine that absolute chance is a factor of the universe" (6.201). It is an avowedly metaphysical doctrine the analysis of which would carry us far beyond the intended scope of our study (and of my own competence). It should be sufficient for our present exploration into fallibilism to note that if absolute chance, or spontaneity, is at play in the universe, then there is always the possibility that a degree of indeterminacy of behavior or character adheres to any object of our knowledge (and to our own cognitive apparatus) and, to that extent, our knowledge is potentially "fail-able," i.e., fallible.

The universe is not a mere mechanical result of the operation of blind law. The most obvious of its characters cannot be so explained. It is the multitudinous
facts of all experience that show us this; but that which has opened our eyes to these facts is the principle of fallibilism (1.162).

2. **Theory of Signs.** At least two considerations drawn from Peirce's theory of signs lend support to an extreme version of fallibilism. First of all, since all thinking is by means of signs, and the meaning of any sign is itself another sign, it follows that any judgment (however seemingly 'infallible') is interpreted and evaluated by yet another judgment-sign; consequently, evaluation of the former judgment is colored, for better or worse, by the potential fallibility of the latter, the truth-maintaining quality of which is rendered vulnerable by the necessary involvement of the faculty which we loosely describe as "memory." Now, the point to be made regarding this consideration is not simply that "the deceptions and inexactitude of memory are proverbial" (1.146), but that in an important sense all judgments share something of the 'incorrigibility' so distinctive in perceptual judgments. (See page 99 of this study.) I believe this to be what Peirce has in mind in the following passage:

> By belief, I mean merely holding for true--real, genuine, practical holding for true--whether that which is believed be the atomic theory, or the fact that this ink is pretty black, or what you will. You may well say that Belief may be mistaken. Yes, the nearest certain of anything is, for example, that this paper is white or whitish--or **appears** so.
Yet it is easy to show that this belief may be mistaken. For the judgment can never relate to the appearance at the instant of the judgment, because the subject of any judgment must have been known by collateral acquaintance.

For Peirce, any judgment, any thought, considered in and of itself as a unit abstracted from the thinking-process, is an impenetrable and inscrutable entity as devoid of cognitive significance as a Kantian Ding-an-Sich; for, as we learn from the theory of signs, any such "unit" of the thinking-process is meaningful only insofar as it addresses itself to, and links up with, the on-going development and unfolding of that process:

...a faculty of producing thoughts from others must belong to every mind which can investigate. Without a succession of ideas in time it is clear that no reasoning is possible. ... Without it and without the determination of one idea by another no thought in any proper sense of the word is possible (7.326).

Thus all judgments, much like perceptual judgments, have a certain raw, incorrigible 'given-ness' and gain their intellectual significance only by being ground down through the refining mill of the interpretative sign-process. In fact, when we reflect upon any judgment, we are, in an important sense, already operating with something other than the original judgment; for the latter is a unique moment in the sign-medley which constitutes the thinking mind, and we can no more "get back" the original judgment than we can retrieve a now past sense datum:
Introspection does not directly reveal what is immediately present to consciousness, at all: but only what seems to have been present from the standpoint of subsequent reflection. It does not even tell what the normal appearance from this subsequent standpoint is, without its testimony being falsified at all times with serious accidental errors.

We cannot directly observe even so much as that there is such a thing as present consciousness (7.420).

Yet, of course, in another important sense we do indeed retain the original judgment while we contemplate, analyze, and evaluate it; and to get at this other sense it is useful to appropriate Peirce's famous type-token distinction.

As a unique, non-repeatable element in the intellectual sign-process, a judgment might be viewed as a sign-token; but as an enduring or recurring component in that process the judgment would have to be construed as a sign-type. Now the fallibilistic rub with respect to sign-types is that they retain their respective identities only through the mediation of an interpretative theoretical framework which Peirce refers to as "collateral acquaintance" (as in the passage cited at the bottom of page 188) or "collateral observation":

...by collateral observation, I mean previous acquaintance with what the sign denotes. Thus if the Sign be the sentence "Hamlet was mad," to understand what this means one must know that men are sometimes in that strange state; one must have seen madmen or read about them; and it will be all the better if one specifically knows (and need not be driven to presume) what Shakespeare's notion of
insanity was. All that is collateral observation and is no part of the interpretant. But to put together the different subjects as the sign represents them as related—that is the main (i.e., force) of the interpretant-forming (8.178-9).

And so, it seems, the potential fallibility of any judgment (as sign-type) has to be assayed by evaluating the veracity of the 'collateral acquaintance' which determines the character of that judgment; but such an evaluation is itself a judgment whose veracity can be gauged only by a thorough evaluation of the collateral acquaintance which determines the character of that judgment—etc., ad infinitum. Hence, despite the subjective certainty which attaches to judgments such as 'This paper appears whitish' and 'Two times two is four', the conclusive establishment of such judgments as being infallibly true lies, on the Peircean view, beyond the capability of human intellection.

The second consideration—not wholly unrelated to the first—to be drawn from the theory of signs to lend its support to fallibilism is somewhat less comprehensive in scope but manages to strike at the putative infallibility of such "indubitable" beliefs as those having to do with the analytic truths of mathematics and logic. We recall from our inquiry in Chapter I of this study that Peirce construes all genuine signs (including thought-signs) as having iconic, indexical, and symbolic aspects. If we attend sympathetically to the iconic aspects of signs,
some interesting insights are forthcoming:

We may...say that excepting the colligation of different beliefs the whole of inference consists in observation, namely in the observation of icons. Even the colligations well up from the depths of consciousness in precisely the same manner as that in which the special features of icons are remarked.

Thus, all knowledge comes to us by observation, part of it forced upon us from without from Nature's mind and part coming from the depths of that inward aspect of mind, which we egotistically call ours; though in truth it is we who float upon its surface and belong to it more than it belongs to us. Nor can we affirm that the inwardly seen mind is altogether independent of the outward mind which is its Creator (7.557-8).

At play in this passage is a distinction which recurs frequently throughout the Collected Papers: the distinction between the 'Outer' and 'Inner' worlds of experience, the former being distinguishable from the latter by the level of control (or lack of it) which we are able to exert over the content of its experiences:

Over the Inward, I have considerable control, over the Outward very little. It is a question of degree only. . . . The distinction between the Inward and the Outward is merely one of how much . . . (4.87).

Given that distinction, it follows, for Peirce, that investigations into such a priori fields of study as logic and mathematics are, in a very important way, as much experimental sciences as are physics and chemistry, as we
can see when we consider the manner in which the logician or mathematician evolves the "necessary" truths so characteristic of their branches of science:

It is not by a simple mental stare, or strain of mental vision. It is by manipulating on paper, or in the fancy, formulæ or other diagrams—experimenting on them, experiencing the thing. Such experience alone evolves the reason hidden within us and as utterly hidden as gold ten feet below ground—and this experience only differs from what usually carries that name in that it brings out the reason hidden within and not the reason of Nature, as do the chemist's or physicist's experiments (4.86).

Here again (cf. p.188ff.) we are confronted with a species of judgment which is not normally associated with perceptual judgment but which is structurally very similar to the latter:

(The). . .indefensible compulsiveness of the perceptual judgment is precisely what constitutes the cogency of mathematical demonstration. One may be surprised that I should pigeon-hole mathematical demonstration with things unreasonably compulsory. But it is the truth that the nodus of any mathematical proof consists precisely in a judgment in every respect similar to the perceptual judgment except only that instead of referring to a percept forced upon our perception, it refers to an imagination of our own creation (7.659) (Italics mine)

That Peirce construes mathematics and logic to be experiential—and experimental—sciences should not be taken to mean that on his view the truths generated within those fields of inquiry are either synthetic or contingent in
nature. Peirce's position was just the opposite, for the activity of the practitioners of those sciences essentially consists in the analysis of the features of certain hypothetical constructs (icons) which have no (indexical) reference to the Outer world of physical reality:

.. .all mathematicians now clearly see that mathematics is only busied about purely hypothetical questions. As for what the truth of existence may be the mathematician does not (qua mathematician) care a straw. It is true that early mathematicians could not clearly see that this was so. But for all their not seeing it, it was just as true of the mathematics of early days as of our own. . . . The early mathematician had certainly no more tendency than the modern to inquire into the truth of. . .(a certain postulate of Euclid's); but quite the reverse. What he really did, therefore, was merely to deduce consequences of unsupported assumptions, whether he recognized that this was the nature of his business or not. Mathematics, then, really was, for him as for us, the most abstract of the sciences, cut off from all inquiry into existential truth (1.53).

But to the extent that logic and mathematics are observational and experimental sciences, they share (albeit to a lesser degree) in the fallibility traditionally acknowledged as attaching to the physical sciences:

Theoretically, I grant you, there is no possibility of error in necessary reasoning. But to speak thus "theoretically," is to use language in a Pickwickian sense. In practice, and in fact, mathematics is not exempt from that liability to error that affects everything that man does. Strictly speaking, it is not certain that twice two is four. If on an average in every thousand figures obtained by addition by the
average man there be one error, and if a thousand million men have each added 2 to 2 ten thousand times, there is still a possibility that they have all committed the same error of addition every time. If everything were fairly taken into account, I do not suppose that twice two is four is more certain than Edmund Gurney held the existence of veridical phantasms of the dying or dead to be (5.577).²

3. Theory of Inference. In Chapter II of this paper we noted that, to Peirce, all thought consists in inference and, as such, is ultimately analyzable into three inferential modes: abduction, induction, and deduction. I went on to point out (pp. 105-107) that Peirce's view on the interaction of the three modes of inference seems to parallel his position with respect to the inter-relation of his three phaneroscopic categories; that is to say, much as no phenomenon can be isolated that is wholly devoid of the presence of all three categories, so too no slice of the inferential thought-process that we might select for examination would, under sufficient scrutiny, fail to display the operation of each of the three modes of inference -- no matter how highly that "slice" might be charged by the activity of any one of the modes. From such considerations flow at least two lines of thought which support a fallibilistic view of human cognition.

First of all, if all reasoning is imbued with the aspects of probable inference (i.e., induction and
abduction) then it would seem to follow (putting it rather tritely) that the conclusion evinced by any given act of reasoning is never than more or less probably true. And probability itself turns out to be an evanescent ally of reason if we consider that the limitations of inductive inference (as judgment of "the proportion of something in a whole collection by the proportion found in a sample") include the following:

We cannot be absolutely certain that our conclusions are even approximately true; for the sample may be utterly unlike the unsampled part of the collection. We cannot pretend to be even probably exact; because the sample consists of but a finite number of instances and only admits special values of the proportion sought (1.141).

Deductive inference, of course, wears its badge of apodicticity proudly, but unfortunately, on the Peircean view, there is no such thing as a deductive inference disembroiled of the intrusion (however covert) of the other two modes of inference.

The second point I would like to make here may be viewed as being simply a special case of the first, but I think it merits formulation in its own right. Again harking back to Chapter II (pages 117-121), we remember that there is reason to construe application of the pragmatic criterion of meaning as exhibiting the key elements involved in sign-interpretation, and that such interpretation, in terms of Peirce's theory of inference, is primarily
abductive in character. Our discussion at that point was chiefly concerned with the interpretation of word-signs, i.e., entities in what Peirce would call the "Outer world" of experience; but we should keep in mind that the distinction between the Outer and Inner worlds "is after all only relative" (5.45) and that the internal thought-process itself is essentially of the form of a dialogue:

.. .a person is not absolutely an in
individual. His thoughts are what he
is "saying to himself," that is, is say-
ing to that other self that is just
coming into life in the flow of time.
When one reasons, it is that critical
self that one is trying to persuade; and
all thought whatsoever is a sign, and is
mostly of the nature of language (5.421).

Therefore, it seems quite legitimate to now explicitly ex-
tend the abductive characterization of sign-interpretation
to those rather occult entities of the Inner world,
thought-signs. In so doing we are immediately confronted
by a major fallibilistic consideration: since all judg-
ments presume interpretation of their constituent con-
cepts, all judgments--no matter how clear, distinct,
apodictic, intuitively certain, etc.--posses a hypothetical
(i.e., abductive) character\(^3\) which renders the conclusive
establishment of their veracity contingent upon their
capacity to remain unfalsified throughout the course of
future experience. And as we shall see in the following
paragraphs, viewed from a Peircean perspective the only
jury that could arrive at a truly conclusive verdict on
any judgment is always 'still out'.

4. **Generality.** Certain reflections concerning the nature of generality constitute, par excellence, the case for Peirce's fallibilism, functioning at once as an independent line of thought supporting that doctrine and as an ideal complement to the series of fallibilistic considerations adduced above from the theory of signs and theory of inference. Looking over the latter set of considerations we can discern a common theme running more or less prominently through each: namely, that all cognitions are of the nature of hypotheses, the veracity of which are to be evaluated on the one hand by the quality of the body of prior cognitions ("collateral acquaintance") which have determined the shape into which the machinery of the mind has molded its hypotheses and, on the other hand, by the capacity of those hypotheses to remain unfalsified when running the harsh gauntlet of future experience. Now, the issue of future experience is, within the Peircean epistemological framework, nothing other than the issue of the relation of generality to human cognition. By way of leading into the aspects of this matter directly relevant to fallibilism, it is worthwhile to take a brief look at Peirce's position on the meaning of statements and judgments having to do with the past.

It is one of the outstanding peculiarities of Peirce's pragmatic perspective, as we have seen, that the
intellectual purport of all propositions is depicted as essentially having reference to the future. Statements and judgments concerning the past are no exceptions, and Peirce calls the logical mechanism by which reference to the past is converted to reference to the future, "mellonization":

...the true idealism, the pragmaticistic idealism, is that reality consists in the future. By mellonization (Gr. the being about to do, to be, or to suffer) I mean that operation of logic by which what is conceived as having been (which I call conceived as parelythose) is conceived as repeated or extended indefinitely into what always will be (or what will some day be, that is, its absence will not always be, which equally involves mellonization, which does not assert anything but is merely a mode of conceiving) (8.284).

In the following passage Peirce 'mellonizes' the content of a simple statement concerning a certain speech defect attributed to Aristotle:

Knowledge which should have no possible bearing upon any future experience—bring no expectation whatever—would be information concerning a dream. But in truth no such thing can be presumed of any knowledge. We expect that in time it will produce, or reinforce, or weaken some definite expectation. Give science only a hundred more centuries of increase in geometrical progression, and she may be expected to find that the sound waves of Aristotle's voice have somehow recorded themselves. If not, it were better to hand the reports... (of Aristotle's speech defect)... over to the poets to make something pretty of, and thus turn them to some human use. But the right thing to do is to expect the verification.
It is the degenerate pronunciation that is to be expected; the occasion is when Aristotle's voice shall become virtually heard again or when we shall have some other information which shall confirm or refute those reports (5.542).

Given this reduction of judgments concerning the past to judgments (i.e., hypotheses) concerning the future, inductive inference takes front and center stage as the only logical actor capable of establishing the truth of any judgment:

Abduction furnishes all our ideas concerning real things...but is mere conjecture, without probative force... Induction gives us the only approach to certainty concerning the real that we can have (8.209).

But this inductive "approach to certainty" that is conferred upon some of our judgment-hypotheses is always more or less of a tentative and tenuous nature:

We cannot ordinarily hope that our hypothesis will pass through the fire of induction, absolutely unmodified. Consequently, we ought not to conclude that it is absolutely correct, but only that it very much resembles the truth (7.216).

The difficulty which induction faces in infallibly establishing the truth of any hypothesis which it is testing (over and above other fallibilistic difficulties already alluded to on previous pages) is that the meaning of that hypothesis (couchable in pragmatic "If...then...", consequential terms) is unalterably general in character; and, therefore, no matter how extensive the inductive
sampling of experiences supporting the hypothesis may be, the meaning of the hypothesis remains forward-looking, or future-referential, and there is always conceivable room for more testing:

Now it is precisely the pragmatist's contention that symbols, owing their origin (on one side) to human conventions, cannot transcend conceivable human occasions. At any rate, it is plain that no possible collection of single occasions of conduct can be, or adequately represent all conceivable occasions. For there is no collection of individuals of any general description which we could not conceive to receive the addition of other individuals of the same description aggregated to it (5.532).

Peirce's remarks here apply equally well to those species of generality which in Chapter III I arbitrarily dubbed 'internal' and 'external' generality, and the point to bear in mind is not simply that one can apply the same test of a judgment-hypothesis an indefinite number of times—and conceive of the test being performed ad infinitum—but that the very meaning of the judgment, on the pragmatic analysis, has reference to an endless series of tests. Viewed in this light, no finite number of tests could ever conclusively confirm any judgment, though of course they can and do consider varying levels of practical confidence in the truth or falsity of certain of our judgments.

At least as supportive of a fallibilistic view of cognition is acceptance of Peirce's position regarding what I described in Chapter III as 'operational generality'.
In the following passage, I think it safe to say, Peirce is referring to this species of generality when describing the "third grade of meaning" which a word possesses:

A word has meaning for us in so far as we are able to make use of it in communicating our knowledge to others and in getting at the knowledge that these others seek to communicate to us. That is the lowest grade of meaning. The meaning of a word is more fully the sum total of all the conditional predictions which the person who uses it intends to make himself responsible for or intends to deny. That conscious or quasi-conscious intention in using the word is the second grade of meaning. But besides the consequences to which the person who accepts a word knowingly commits himself to, there is a vast ocean of unforeseen consequences which the acceptance of the word is destined to bring about, not merely consequences of knowing but perhaps revolutions of society. One cannot tell what power there may be in a word or a phrase to change the face of the world; and the sum of these consequences makes up the third grade of meaning (8.176).

If the presence of operational generality in language really entails that "we can never know precisely what we mean by any description whatever" (7.119), and if the virtual equation of language and thought, which is the dominant working assumption of Peirce's theory of signs, is correct, then it would seem to follow that we can never know precisely what our own judgments (which are simply a special class of descriptions) mean. And that, indeed, is fallibilism of a most radical variety.
To some philosophical tastes Peirce's fallibilism must surely seem a queer, paradoxical, and destructive doctrine. Oddly enough, however, Peirce saw fallibilism as an ideal tonic for the health of human inquiry in general and scientific investigation in particular. His cardinal rule for sustaining the vigor of intellectual development was "Do not block the way of inquiry" (1.135), and he viewed belief in so-called infallible doctrines as one of the chief obstacles in the path of such development:

We come then to this question: of what importance is. . .(fallibilism)? Let us see.

How can such a little thing be of importance, you will ask? I answer: after all there is a difference between something and nothing. If a metaphysical theory has come into general vogue, which can rest on nothing in the world but the assumption that absolute exactitude and certitude are to be attained and if that metaphysics leaves us unprovided with pigeon-holes in which to file important facts so that they have to be thrown in the fire—or to resume our previous figure if that metaphysical theory seriously blocks the road of inquiry—then it is comprehensible that the little difference between a degree of evidence extremely high and absolute certainty should after all be of great importance as removing a mote from our eye (1.152-3).

Whether or not fallibilism serves the salutary function that Peirce attributes to it, however, it should not be viewed as an aberrant tenet of his philosophy, to be ignored at will while we try to understand and appreciate the (perhaps) more palatable aspects of his
epistemology. As the foregoing pages of this chapter have tried to convey, not only does fallibilism spring facilely from the conceptual pivots of Peirce's pragmatic epistemology (i.e., the theory of signs and theory of inference), but it is also an ineluctable consequence of his views on the nature of generality—views which in Chapter III we saw to be at the very heart of his pragmatism. Thus, it seems to me, fallibilism deserves to be construed as yet another essential feature of that broad epistemological perspective which is Peirce's pragmatism. 

Critical Common-sensism

As noted earlier, Peirce eventually came to incorporate his fallibilism into a broader epistemological doctrine termed "critical common-sensism." At one point fairly late in his career he refers to the latter doctrine as a "consequence" of belief in the truth of his pragmatism (5.439). If we interpret the word 'consequence' in its usual Peircean sense, that is, as something which forms part of the very meaning of an idea (rather than as merely something which "follows from" an idea, possibly requiring for its derivation a set of additional assumptions having no particular relationship to the original idea), then we should expect the link between pragmatism and critical common-sensism to be intimate indeed. Moreover, still later in his career, Peirce acknowledges that: "I have
myself called pragmatism "critical common-sensism"; but, of course, I do not mean this for a strict definition" (5.494). So then, whether the equation or overlap of pragmatism and critical common-sensism be literal or virtual, clearly in Peirce's mind some sort of major fundamental linkage is there. Nevertheless, the attentive student of Peirce should not be overcome with chagrin if he or she fails to immediately perceive how critical common-sensism is supposed to snap neatly into place within the framework of Peirce's pragmatic epistemology, for critical common-sensism is a multifaceted doctrine that employs references to notions which have little obvious bearing on the core concepts of that epistemology. The following passage, one of the few attempts at a detailed characterization of critical common-sensism to appear in the Collected Papers, purports to describe the essentials of the doctrine and should give the reader a feeling for the problem to which I allude:

(Man possesses) . . . no infallible introspective power into the secrets of his own heart, to know just what he believes and what he doubts. The denial of such a power is one of the clauses of critical common-sensism. The others are that there are indubitable beliefs which vary a little and but a little under varying circumstances and in distant ages; that they partake of the nature of instincts, this word being taken in a broad sense; that they concern matters within the purview of the primitive man; that they are very vague indeed (such as, that fire burns) without being perfectly so; that while it may be
disastrous to science for those who pursue it to think they doubt what they really believe, and still more so really to doubt what they ought to believe, yet, on the whole, neither of these is so unfavorable to science as for men of science to believe what they ought to doubt, nor even for them to think they believe what they really doubt; that a philosopher ought not to regard an important proposition as indubitable without a systematic and arduous endeavor to attain to a doubt of it, remembering that genuine doubt cannot be created by a mere effort of will, but must be compassed through experience; that while it is possible that propositions that really are indubitable, for the time being, should nevertheless be false, yet in so far as we do not doubt a proposition we cannot but regard it as perfectly true and perfectly certain; that while holding certain propositions to be each individually perfectly certain, we may and ought to think it likely that some one of them, if not more, is false (5.498).

Of course, we can see that fallibilism rears its head throughout this passage, and it was my contention in the previous section of this chapter that fallibilism does hook up rather naturally with the other pragmatic elements of Peirce's epistemology. Therefore, to get at the features of critical common-sensism which perhaps do not as obviously flow from pragmatic considerations, we might distill out from the cited passage those points which are more or less clearly fallibilistic in character (that is, those having to do with infallible powers, vagueness, belief in what should be doubted, and the probable falsity of some of our most certain beliefs) and thereby isolate the residue that warrants further explanation. Doing so,
the residuum would seem to consist in something like the following set of propositions:

1. There are indubitable beliefs.

2. Broadly speaking, a great many\(^5\) of these indubitable beliefs are instincts which are theoretically traceable back to primitive ages and vary only slightly from epoch to epoch.

3. What we do not doubt we cannot but regard as being perfectly true and certain.

4. We should subject our indubitable beliefs to the severest scrutiny and experiment.\(^6\)

The fourth of these propositions should itself, I think, be construed as a methodological corollary of fallibilism; for if any given "important" belief can never (as fallibilism maintains) be conclusively verified, to fail to subject it to such criticism and testing as is feasible would be to possibly set up a false hypothesis as an obstacle to scientific and philosophical inquiry's hoped-for rendezvous with truth. Consequently, the focus of the next several pages of this chapter will be upon the first three of the above propositions and their possible relation to the nucleus of Peirce's epistemology.

It is an irony of Peirce's critical common-sensism that in its fallibilistic mode it points, almost in Humean
fashion, to the fallibility of our most "intuitively certain" beliefs, while in its "common-sense" mode it countenances the somewhat Cartesian view that we do indeed possess indubitable beliefs. Perhaps even more ironic though is the fact that a credible case can be made for the thesis that the fallibilistic and common-sense elements of the larger doctrine share much the same conceptual underpinnings. To prepare the way for fleshing out such a thesis we should call attention to the fact that when Peirce says the following: "...no belief is found... absolutely irresistible. There is always room for the reflection that an error may have been committed" (7.462), he follows it up with the remark that "Absolute doubt is also impossible" (7.462n). Now, one fairly obvious reason that absolute doubt is impossible is that when the lever of doubt is setting about its business of dislodging some well-entrenched belief, that lever must itself rest upon some stationary belief which serves as its fulcrum: "A man cannot criticize every part of his reasoning, since he cannot criticize the act of reasoning he is performing in the criticism..." (2.209). Our beliefs and our doubts are not crystallized in an intellectual vacuum but rather presume a whole nexus of ideas both consciously and unconsciously arrived at. To have tacitly pretended that the situation could be otherwise is, to Peirce, one of the fatal flaws in Descartes' 'methodic doubt' modus operandi:
We cannot begin with complete doubt. We must begin with all the prejudices which we actually have when we enter upon the study of philosophy. These prejudices are not to be dispelled by a maxim, for they are things which it does not occur to us can be questioned. Hence this initial skepticism will be a mere self-deception, and not real doubt; and no one who follows the Cartesian method will ever be satisfied until he has formally recovered all those beliefs which in form he has given up. . . . A person may, it is true, in the course of his studies, find reason to doubt what he began by believing; but in that case he doubts because he has a positive reason for it, and not on account of the Cartesian maxim. Let us not pretend to doubt in philosophy what we do not doubt in our hearts (5.265).

Certainly, from the Peircean perspective, the inadequacy of the Cartesian method stems chiefly from an overly simplistic notion as to the natures of doubt and belief and the relationship between the two.

On Peirce's own (mildly behavioristic) view, the key distinguishing feature of belief is that it functions as a habit of, or disposition for, action, while doubt represents the absence, upon reflection, of such a habit:

Doubt is a state of mind marked by a feeling of uneasiness; but we cannot, from a logical, least of all from a pragmaticistic point of view, regard the doubt as consisting in the feeling. A man in doubt is usually trying to imagine how he shall, or should, act when or if he finds himself in the imagined situation. He supposes himself to have an end in view, and two different and inconsistent lines of action offer themselves. . . . His pent-up activity finds vent in feeling, which becomes the more prominent from his attention no longer being absorbed in action. A true
doubt is accordingly a doubt which really interferes with the smooth working of the belief-habit. Every natural or inbred belief manifests itself in natural or in-bred ways of acting, which in fact constitute it a belief-habit. (I need not repeat that I do not say that it is the single deeds that constitute the habit. It is the single "ways," which are conditional propositions, each general). A true doubt of such a belief must interfere with this natural mode of acting (5.510).

On this view, an indubitable belief is simply one that, for the time-frame under consideration, is free from the interfering influence of doubt. Indubitability, then, need not be tied to eternal verities nor retain its character throughout millenia: the critical common-sensist "quite acknowledges that what has been indubitable one day has often been proved on the morrow to be false" and concedes, in the true fallibilistic spirit, "the precise proposition that it may be so with any of the beliefs he holds" (5.514). Working with such an enervated notion of 'indubitability', Peirce thus has made the case, by definition, for the truth of the third of the propositions listed on page 207. Viewing the matter from the perspective of Peirce's theory of inference:

. . . there are no such beings as absolute sceptics. Every exercise of the mind consists in inference, and so, though there are inanimate objects without beliefs, there may be no intelligent beings in that condition (5.318).

And it is here, in the theory of inference, that we can uncover a significant link between critical common-sensism
and pragmatism.

In the first section of this chapter I tried to show an important sense in which all judgments, even those properly characterized as being the products of deductive or inductive inference, possess an abductive character by virtue of the necessary involvement of the operation of sign-interpretation. If we look at the matter a bit more closely I think we can discern two key elements within such abduction-interpretation—and, indeed, within all forms of abduction. First, we have the rather obvious creative element which Peirce cites as the hallmark of abduction. It is the glory of abduction that it always yields something over and above what it is given. For example, in a perceptual abduction we might have such 'givens' as a set of colored patches; it is abduction that transforms this set of patches into a bus, a baseball, or a boy. Similarly, in the process of sign-apprehension, the entity (be it a sound, a series of ink-marks on a piece of paper, or a thought) which constitutes the 'given' (i.e., the sign-token or sign-vehicle) is transformed into a symbol of something other than itself (i.e., its object) through the mediation of an act of abductive interpretation. In appreciating the creative feature of abductive inference, however, we should not ignore the presence of a conservative element in its operation—that which Peirce addresses by the name of "collateral acquaintance." (see pages 188 and
190) In perceptual abductions "we perceive what we are adjusted for interpreting" (5.185); that is, the sensory 'given' is transformed into a perception of such-and-such according to an already established framework for perceptual interpretation, the precise structure of that framework having been determined by the character of the perceiver's previous experiences. (Here I am using the term "experience" in the broad Peircean sense to admit of occurrences and activities in both the "Outer and Inner worlds.") For example, when I abductively translate a certain set of visual data into an image of a bus, I do so according to my own pre-established "theory as to what constitutes a bus, and this theory is in turn the product of my own past acquaintance with, and thoughts about, buses. In much the same fashion, when I encounter the word "bus" in a written or spoken statement, or when I entertain in my imagination some proposition concerning a bus, the sound or set of ink marks or thought is rendered into a sign of a bus according to my prior personal beliefs concerning the nature of buses, i.e., according to my 'collateral acquaintance' with buses, or at least, thoughts about buses. Thus, the Peircean view of abduction in general, and abductive interpretation in particular, seems to be that on the one hand abduction always provides us with something more than is given in present experience, but that, on the other hand, the configuration of this
"something more" is inevitably determined by our already existing network of beliefs grounded in prior experience.

Before we explicitly relate this rendition of the Peircean view of abduction to the issue of critical common-sensism's links with pragmatism, we need to reflect for a moment on the character of the beliefs at work in the "conservative" element of abductive inference. It is of some relevance to the present stage of our inquiry to ask what level of conviction, if any, attaches to such beliefs. If there is a simple categorical answer to this question on Peircean grounds, I think it is suggested by the following characterization of abduction's creative element:

The abductive suggestion comes to us like a flash. It is an act of insight, although of extremely fallible insight. It is true that the different elements of the hypothesis were in our minds before; but it is the idea of putting together what we had never before dreamed of putting together which flashes the new suggestion before our contemplation (5.181).

We may labor for hours, days, or even years to generate an hypothesis that appears to explain some 'given'; but when we finally make the mental leap from 'given' to explanatory hypothesis, that leap is instantaneous and, in some sense, unwavering. It would be a weak leap indeed if it were made from a mire of equivocal and vacillating collateral beliefs. The hypothesis which was generated may well be immediately judged to be of dubious veracity,
but it would seem that somewhere within the network of beliefs which fostered its generation there must be beliefs—the "fulcrums" of the abductive inference—which, at least for the time being, we do not doubt but, rather, regard as "perfectly true and certain." In the following passage (which appears at the close of a brief discussion of man's faculty for making correct guesses) Peirce describes the matter colorfully:

. . . we often derive from observation strong intimations of truth, without being able to specify what were the circumstances we had observed which conveyed those intimations.

It is a chapter of the art of inquiry. Our faculty of guessing corresponds to a bird's musical and aeronautic powers; that is, it is to us, as those are to them, the loftiest of our merely instinctive powers. I suppose that if one were sure of being able to discriminate between the intimations of this instinct and the self-flatteries of personal desire, one would always trust to the former. For I should not rate high either the wisdom or the courage of a fledgling bird, if, when the proper time had come, the little agnostic should hesitate long to take his leap from the nest on account of doubts about the theory of aerodynamics (7.46-47).

We will probe Peirce's views on the role of instinct in human inquiry in just a moment, but before doing so it might be well to tie together certain points already made. First, let us again retrieve the consideration from Chapter II to the effect that any application of the pragmatic criterion of meaning is simply a special case of
abductive sign-interpretation. Next, let us re-instance the point made a couple of pages ago, that such interpretation (as does all abduction) involves the "conservative" employment of collateral acquaintance, i.e., a network of pre-existing beliefs established in the course of prior experience. And, finally, we should iterate the view just expounded, that when these collateral beliefs come into play, they lie beyond the pale of the influence of doubt; that is, the intellect acts upon them as though they were "perfectly true and certain." Fusing all these points together, it would seem to follow that application of the pragmatic criterion of meaning implicitly involves reliance upon beliefs which are, at the time they are employed, regarded as indubitable. And if that be so, it would further appear to follow that acceptance of the pragmatic theory of meaning entails tacit acknowledgment of the first and third of the propositions listed at the top of page . Thus, we have at least one level at which key elements of critical common-sensism, separated out from that doctrine's purely fallibilistic elements, constitute 'consequences' of Peirce's pragmatic epistemological perspective.

A few pages ago I made the point that Peirce's theory of cognition involves the view that our beliefs and doubts are not monadic self-generated affairs but, rather, "presume a whole nexus of ideas both consciously and
unconsciously arrived at." The reference to "unconsciously arrived at ideas," though not unproblematic, seems safe enough for present purposes, inasmuch as it is fairly clear that we know infinitely more facts than we have ever consciously entertained. (For example, the reader can probably rightly be said to know how to escape from an oversized brown-paper grocery sack although it is unlikely that he or she has ever pondered the matter. Similarly, we all know that the planets in our solar system did not achieve their present orbital patterns through the intervention of the Bekins Moving and Storage Company—a proposition which, surely, has been contemplated by only the most perverse of intellects.) The question that needs to be posed to the Peircean then is: By means of what faculty do we unconsciously acquire knowledge? The answer, for Peirce, definitely does not lie with the faculty of reason:

Reasoning, properly speaking, cannot be unconsciously performed. A mental operation may be precisely like reasoning in every other respect except that it is performed unconsciously. But that one circumstance will deprive it of the title of reasoning. For reasoning is deliberate, voluntary, critical, controlled, all of which it can only be if it is done consciously. An unconscious act is involuntary: an involuntary act is not subject to control; an uncontrollable act is not deliberate nor subject to criticism in the sense of approval or blame. A performance which cannot be called good or bad differs most essentially from reasoning (2.182).
This view of reasoning generates a sweeping dichotomy: on the one hand we have reasoning, i.e., controlled, critical, deliberate inferential activity; and all other cognition Peirce files under the broad heading of *instinct*, the well-spring of most of our knowledge (both conscious and unconscious):

> It is really instinct that procures the bulk of our knowledge; and those excessively simple reasonings which conform to the requirements of logic are, as a matter of fact, mostly performed instinctively or irreflectively (2.181).

On this view, Reason, man's crowning glory, is construed to be functionally subordinate to instinct:

> Every race of animals is provided with instincts well adapted to its needs, and especially to strengthening the stock. It is wonderful how unerring these instincts are. Man is no exception in this respect; but man is so continually getting himself into novel situations that he needs, and is supplied with, a subsidiary faculty of reasoning for bringing instinct to bear upon situations to which it does not directly apply. This faculty is a very imperfect one in respect to fallibility; but then it is only needed to bridge short gaps (6.497).

Peirce's employment of the term 'instinct' is typically idiosyncratic. In one chapter of the *Collected Papers* he plays around with the notion at some length and justifies a seemingly minor expansion of the signification of the term in a fairly straightforward manner:

> (An). . . instinct, in the proper sense of the word, is an inherited habit, or in
more accurate language, an inherited disposition. But since it is difficult to make sure whether a habit is inherited or is due to infantile training and tradition, I shall ask leave to employ the word "instinct" to cover both cases (2.170).

He does not "ask leave" to use the term 'instinct' in the still further extended sense of unreflective cognition but nevertheless proceeds in the same article and elsewhere to employ the term in that fashion. He uses it "in that broad sense in which it will include all habits of which we are not prepared to render an account" (2.175), describes it as capable of growth and development in the life of an individual (1.648), and characterizes "acritical inferences" in general as being essentially instinctive in character (5.445). Perhaps he felt that it went without saying that cognition that is not evolved in a controlled, deliberate, reasoned manner must somehow trace back to either an "inherited disposition" or "infantile training."

Given the breadth of Peirce's notion of 'instinct', it would now seem an easy enough matter to unravel at least one sense in which acceptance of the basic tenets of pragmatism involves acquiescence with the main thrust of the second of the critical common-sensist propositions appearing at the top of page 207. For, if it be true that application of the pragmatic criterion of meaning necessarily involves tacit reliance on a nexus of beliefs arrived at through collateral acquaintance, the conclusion
that that nexus includes at least some instinctive (i.e., unreasoned) beliefs seems inescapable. We can try to resist it by hypothesizing a situation in which an act of pragmatic sign-interpretation is grounded wholly in a certain specifiable set of well-reasoned beliefs (reasoned, that is, in the tight Peircean sense); but then we might be challenged to specify the collateral beliefs which determined the "premisses" of those well-reasoned beliefs, and so on, until we would finally be forced to concede that at some level our interpretative act relied on a belief—and much more likely, a plethora of beliefs—which we had not until now subjected to the critical scrutiny of reasoning. By way of example, in the following passage Peirce alludes to a simple, seemingly perfectly rational (and infallible) inference and calls attention to its unreasoned component:

If, with St. Augustine, we draw the inference "I think; therefore, I am," but, when asked how we justify this inference, can only say that we are compelled to think that, since we think, we are, this uncriticized inference ought not to be called reasoning, which at the very least conceives its inference to be one of a general class of possible inferences on the same model, and all equally valid (6.497).

He then goes on to point out the futility involved in attempting to trace the justification for such an inference back to a purely rational foundation built of self-grounding 'first principles':
If it could be made out that all the ultimate (or first) premisses were per-
cepts; and that all the ultimate logical principles were as clear as the principle of contradiction, then one might say that one's conclusion was **perfectly rational**. Strictly speaking, it would not quite be so, because it is quite possible for perception itself to deceive us, and it is much more possible for us to be mistaken about the in-
dubitableness of logical principles. But as a matter of fact, as far as logicians have hitherto been able to push their analyses, we have **in no single case**, concerning a matter of **fact**... been able to reach this point. We are in every case either forced by the inexorable critic, sooner or later, to declare, "such and such a proposition or mode of inference I cannot doubt; it seems per-
factly clear that this is so, but I can't say why," or else the critic himself tires before the criticism has been pushed to its very end (6.497).

The connection between the pragmatic theory of mean-
ing and the tenet of critical common-sensism which affirms the primacy of the role of instinct in the formation of our beliefs can be further reinforced if we continue to key on Peirce's own characterization of pragmatism as "the logic of abduction." We remember from Chapter II that Peirce acknowledges that abduction, when viewed as an argument form, is the weakest of the three fundamental modes of inference; it "merely suggests that something may be" (5.171), and it is parasitic upon induction for support of its conclusions. Putting aside questions concerning the ground of abduction's logical validity, the fact that so many of our abductive conclusions turn out to be true is
a matter that itself begs for some practical explanation.

The explanation, according to Peirce, lies with instinct:

Think of what trillions and trillions of hypotheses might be made of which one only is true; and yet after two or three or at the very most a dozen guesses, the physicist hits pretty nearly on the correct hypothesis. By chance he would not have been likely to do so in the whole time that has elapsed since the earth was solidified. . . .

However man may have acquired his faculty of divining the ways of Nature, it has certainly not been by a self-controlled and critical logic. Even now he cannot give any exact reason for his best guesses. It appears to me that the clearest statement we can make of the logical situation . . . is to say that man has a certain insight, not strong enough to be oftener right than wrong, but strong enough not to be overwhelmingly more often wrong than right, into the Thirdnesses, the general elements, of Nature. . . . This Faculty is . . . of the general nature of Instinct, . . . surpassing the general powers of our reason and . . . directing us as if we were in possession of facts that are entirely beyond the reach of our senses (5.172-3).

Thus, given this view of the essential dependence of abduction on instinct, and given Peirce's equation of pragmatism with the logic of abduction, it seems fair to say that the Peircean characterization of instinct does rightly take its place as a key element within the broad pragmatic epistemological perspective.

Notwithstanding the possible merit in the general claim that the success of abductive inference is largely attributable to the guidance afforded by instinct, it still
might not be adequately clear how the pragmatic criterion of meaning, when construed as an avatar of sign-interpretation, evidences the intimate involvement with instinct that seems so apparent in the formation of scientific hypotheses. Even if we concede the point made on page 218, that is, that an act of pragmatic sign-interpretation must at some level involve dependence upon instinctive belief (through the mediation of 'collateral acquaintance'), our concession seemingly need not commit us to maintaining that the operation of sign-interpretation is in any way as markedly guided by instinct as the process of constructing scientific hypotheses. (And since the characterization of pragmatism as abductive sign-interpretation seems to be the strongest of the three senses, distinguished on page 110, in which pragmatism can be identified with the logic of abduction, the cogency of the link between pragmatism and critical common-sensism, via Peirce's notion of instinct, would appear to be significantly vitiated unless the role of instinct in sign-interpretation can be more clearly delineated.) Nevertheless, I think that if we reflect further upon the matter from the Peircean point of view, it can be shown that pragmatic sign-interpretation is the ne plus ultra of the pervasive role of instinct in human cognition. To facilitate such reflection, a mundane illustration of an act of sign-interpretation might be in order.
Let us suppose that I have been standing at a bus stop for quite a long time, reading a newspaper while waiting for a bus to arrive, and that a woman, a stranger, has been standing there almost as long. While I am attending to a story in the paper, the woman says "Finally, a bus!" Normally under such circumstances my immediate reaction to this speech-sign would be to turn my head expectantly in the anticipated direction of the bus, having interpreted the speech-sign to mean something like 'The bus we've been waiting for is finally arriving'. This interpretation likely is instantaneous and automatic—much like a simple act of sense perception. It is also likely unreflective in the sense that I do not pore over the meaning of the woman's words, trying to reason, as it were, to a correct interpretation. (I might well reflect more or less intensely on the probable truth of her words if the would-be bus is still some distance away and might turn out to be a mis-perceived truck or van, but that is a wholly different matter.) Now, it seems fairly clear from the structure of the example that, in terms of the Peircean reason/instinct dichotomy, my interpretation of the woman's words—to the extent that it is unreflective, and so, uncritical and uncontrolled—has its immediate source of generation in instinct, rather than reasoning. And if we contemplate the situation still further, it would seem that the involvement of instinct in my
interpretation is extremely similar to the role of tacit
censor that instinct plays in the selection of a scientific
hypothesis. For just as a physicist, when formulating an
hypothesis to explain some new phenomenon in the
laboratory, rejects without consideration "trillions and
trillions of hypotheses" which "might be made" to explain
the phenomenon, so too I at my bus stop, by immediately
latching on to the sign-interpretation cited, have rejected
an unlimited number of alternative interpretations. For
instance, the event of the woman's speaking and the speech-
sign itself (her locution) could have been interpreted,
respectively, along any of the following lines:

1. The woman suffers from a rare brain disorder
   that causes her to say the opposite of what
   she means. Hence the locution is to be
   interpreted: 'It is not the case that
   finally a bus is coming.'

2. I am suffering from a rare brain disorder
   that causes me to hear the opposite of what
   is said. Hence the locution is to be
   interpreted: 'It is not the case that
   finally a bus is coming.'

3. The woman is a religious fundamentalist
   "speaking in tongues." Hence the locution
   has only a mystical meaning that is beyond
my ken.

4. The woman is wearing a bustle that has been irritating her and she did not finish the speech act. She probably meant to convey: 'Finally the bustle has stopped irritating me.'

5. The woman is the reincarnation of both Descartes and St. Augustine and is formulating the proposition 'Finally the bus; therefore, I exist.'

Each of the above interpretations (and an unlimited number of other interpretations) of the event and the speech act would, to use the traditional phrase associated with hypothesis formation, 'save the appearances', that is, they constitute internally adequate explanations of the event and the act. Plainly, however, such interpretations would not ordinarily be entertained. A largely unreasoned, i.e., instinctive, theoretical framework that I bring to the event would normally save me the time and trouble of "thinking through" to the implausibility of the interpretations listed; or, if by some adventitious operation of the mind I should entertain such off-the-wall interpretations, their ludicrousness would doubtless strike me immediately—that is, before I could intellectually back up and "reason to" their ludicrousness. We are, after all,
by nature linguistic animals, and the myriad acts of linguistic sign-interpretation that fill our days are, at least from the Peircean point of view I have sketched out, virtually as instinctive in character as the innumerable "un-thought-out" daily physical activities by means of which we get around in, and manipulate, the world around us.

In closing out this section of the present chapter, I would like to touch upon one further connection, having to do with instinct, between pragmatism and critical common-sensism. The link in question involves (as have so many matters treated in this chapter) considerations pertinent to Peirce's theory of inference, but here the focus will be upon induction rather than abduction.

It might have been noticed that, despite the fact that we have been dealing with the doctrine of critical common-sensism for some time now, there has been virtually no explicit reference to 'common-sense' itself in this chapter. (Even the fairly lengthy quoted passage on page 205, in which Peirce recites the essentials of critical common-sensism, fails to employ the expression except as part of the name of the doctrine.) It is unlikely that this omission has occasioned any confusion, however, for the reader probably correctly surmised, or already knew, that for Peirce the terms 'instinct' and 'common-sense'
are interchangeable. Given the breadth of Peirce's notion of instinct, such employment of the term 'common-sense' is not really out of line with that countenanced in standard usage. Nevertheless, given the rather hackneyed status of the term in our language, and given Peirce's penchant for neology, I think we might be justified in tentatively framing an hypothesis to the effect that there is some special added connotation which Peirce is conferring upon the term. The specific version of this hypothesis which I think we ought to entertain is that it is no mere coincidence that the cognates 'common-sense' and 'community' both figure so prominently in his epistemology.

We saw in Chapter III that the Peircean conception of an unlimited community of investigators functions as a regulative principle which helps flesh-out our notions of truth and reality, and that the latter notions—or more exactly, the Peircean notion of those notions—are in turn implicit in the pragmatic theory of meaning. We saw, further, that the concept of this community is implicit as well in Peirce's conception of inductive methodology. Peirce's community is not merely a regulative notion however; rather, its regulative aspect is an idealized extrapolation from Peirce's conception of the nature of the actual community, past and present, of minds in quest of the truth. In fact, we might say that Peirce's notion
of community is stratified into three levels: first, the individual person, who is involved in an on-going dialogue with his or her "future selves"—a community, so to speak, of thought-signs unfolding within the purlieus of what we construe to be a single consciousness; secondly, the actual community (past and present) of individuals interacting willingly and unwillingly, in conflict and cooperative effort, toward an ever more refined and sophisticated comprehension of reality; and thirdly, the idealized, indefinitely large community of minds (a sort of community of communities) which would, in the sufficiently long run, achieve its "destined" rendezvous with truth. It is the first and second level communities which concern us here; for Peircean common-sense (i.e., instinct) is the net result of an individual's and, much more significantly, mankind's previous interaction with the environment:

Common sense...is the resultant of the traditional experience of mankind...

If, walking in a garden on a dark night, you were suddenly to hear the voice of your sister crying to you to rescue her from a villain, would you stop to reason out the metaphysical question of whether it were possible for one mind to cause material waves of sound and for another mind to perceive them? If you did, the problem might probably occupy the remainder of your days... No amount of speculation can take the place of experience (1.654-5).

Simply to say that common-sense, or instinct, is the product of mankind's collective experience does not cut
quite deep enough though to expose the logical structure of the development of that faculty. To better get at the character of that structure, let us suppose for example that the members of a primitive community which existed eons ago had the "common-sense" not to attempt to swim under water with their mouths open. (It is largely irrelevant how this wisdom was originally arrived at and whether or not individuals within that community entered into conscious and critical contemplation of the matter.) The members of that society might then be described as having possessed a disposition for action, i.e., a belief, which if verbalized might have taken a form such as 'It is more unpleasant and unhealthy to attempt to swim under water with one's mouth open than it is to do so with one's mouth closed'. This belief would have been much like an hypothesis, the truth or falsity of which was to have been confirmed or refuted by subsequent experience. (Indeed, it would literally have been an hypothesis if it had been consciously and deliberately posed; but since we are dealing with an instinctive belief, we should limit ourselves to describing it as an analogue of hypothesis.) The testing of the quasi-hypothesis would have proceeded—albeit in an unsystematic and more or less uncontrolled fashion—in something like the manner of the inductive testing of a scientific hypothesis:
One dreams of an inductive proof. One surmises that the belief results from something like an inductive proof that has been forgotten. Very likely it did, in a sense of the term "inductive process" that is so generalized as to include uncontrolled thought (5.516).

And much like a scientific hypothesis, the common-sense belief in question would have been destined to be reinforced, rejected, or modified as the course of experience warranted.

Instinctive beliefs, thus sanctioned by the next best thing to inductive methodology, would be expected to hold a special place of honor in Peirce's pragmatic--and empiricist--epistemology. For if truth is the opinion fated to be settled upon by the unlimited community of investigators through the employment of inductive methodology (or, put another way, through the 'universal workability' of that community's beliefs), then the best approximations to truth that we have here and now should tend to be such beliefs as have survived "the fire of induction" and induction's uncontrolled analogue, general human experience. The more "fire," the better, and this is why common-sense beliefs resulting from the experience of large numbers of individuals (Community Type Two mentioned on page 228) are ordinarily to be more highly valued than beliefs issuing from the experiences of one individual (Community Type One). Even the reasoned conclusions of a "man of science" are rather meagre in comparison to humankind's shared body of
common-sense knowledge; for such a man "is keenly aware of his own ignorance, and knows that personally he can make but small steps in discovery" (8.136). The conclusions of instinct—the "sifted common-sense of mankind" (5.494)—are not only more comprehensive in scope; they constitute the closest thing to infallible knowledge that we have:

Based on large, ordinary experience, far more valuable reservoir of truth than the aggregate of man's special experiences (scientific and extraordinary), worked up in that part of the mind that functions the most delicately and unerringly, reconsidered and revised by countless generations, such conclusion, if unequivocal and pertaining to matter plainly within the competency of good sense, who shall dare to dispute? (6.571)

It might not be too fanciful to say that Peirce's notion of 'concrete reasonableness' here finds a down-to-earth realization within the pragmatic epistemological framework. For if reasonableness consists in the attuning of judgments to the best evidence available, then to be reasonable is, in part, to allow oneself to be guided by the collective weight of the evidence which has shaped our instincts—even though that evidence itself might be forever lost and forgotten, its only surviving traces consisting in the residue of instinctive belief which it shaped. Phrasing the matter another way, if concrete reasonableness at its broadest level (cf. page 178) is conceived identification with the unlimited community of investigators (Community Type Three), we participate in
concrete reasonableness to the extent that we allow our judgments to be guided by the conclusions of the actual community of investigators (Communities Type One and Two) in their exercise of inductive and quasi-inductive (i.e., instinctive) methodology. And so, from the pragmatic standpoint, to follow the dictates of instinct (within limits, of course) is "only reasonable."
NOTES TO CHAPTER IV

1 Charles S. Peirce's Letters to Lady Welby, op. cit., p. 25. Lest the reader conclude from the "this paper is white" example that Peirce means only to be making a generalization about perceptual judgment, it might be well to cite the remainder of the passage from which the quotation is drawn:

There can be no judgment of the very judgment itself. The old Insolubilia, such as "this proposition is false" are examples of this. If it be false, since this is all that it asserts, it must be true; and if it be true, since it denies this, it must be false. Belief that could not be false would be infallible belief and Infallibility is an Attribute of Godhead. The fruit of the tree of knowledge which Satan told Adam and Eve was to make them equal with God was precisely the doctrine that there is some kind of Infallible belief. This must be so; for after this was rendered still more blasphemous by asserting that the kind of belief that was to be Infallible was belief about God, the most utterly unscrutable of my subject, it became the means of corrupting Christianity until the religion of Love was confounded with the Odium theologicum (Ibid.).

2 Peirce goes on in this passage to make the following observations about the fallibility of "necessary reasoning":

Deductive inquiry, then, has its errors; and it corrects them, too. But it is by no means so sure, or at least so swift to do this as is Inductive science. A celebrated error in the Mecanique Celeste concerning the amount of theoretical acceleration of the moon's mean motion deceived the whole world of astronomy for more than half a century. Errors of reasoning in the first book of Euclid's Elements, the logic of which book was for two thousand years subjected to more careful criticism than any
other piece of reasoning without exception ever was or probably ever will be, only became known after the non-Euclidian geometry had been developed. The certainty of mathematical reasoning, however, lies in this, that once an error is suspected, the whole world is speedily in accord about it (5.577).

3 And conversely, "The second thing to remember is that the man's circle of society (however widely or narrowly this phrase may be understood), is a sort of loosely compacted person, in some respects of higher rank than the person of an individual organism" (5.421).

4 Once again, we have an analogue of perception. Just as in perception "we perceive what we are adjusted for interpreting" (5.185), so too, in apprehending the meaning of our own thoughts, we apprehend them through the mediation of an already established framework for interpretation—or, "theory of interpretation" (5.183)—which Peirce alternately describes as "collateral acquaintance" (see p. 188).

5 See also 5.439ff. and 5.505ff.

6 I am taking liberties with the quoted passage by separating the issues of instinct and indubitable beliefs. I do not think, however, that Peirce means to be saying that all indubitable beliefs must be instinctive. (See page 210 for a characterization of Peirce's notion of 'indubitability'.)

7 This is a restatement of Peirce's comment in the long passage on page 205 that "a philosopher ought not to regard an important proposition as indubitable without a systematic and arduous endeavor to attain to a doubt of it," and is not intended to imply that Peirce is recommending that we 'doubt the indubitable'. The futility of the latter sort of recommendation is intensely scouted by Peirce, as quoted passages appearing on pages 206 and 209 will amply reflect.

8 Of course, a disposition for action (including the action of interpretation) might conceivably be traceable back to a conscious, controlled--reasoned--inference which has settled into a "habit" of response, a disposition for action, of which the interpretation is an embodiment.
In such a case the act of interpretation would be unreflective rather than reasoned, and yet it would have its basis in reasoning. It would seem, however, that precious few acts of sign-interpretation would be thus traceable back to reasoning—in the tight and rather exclusive sense in which Peirce employs that term—and that the acts of reasoning to which such interpretations could be traced would, upon analysis, display their own roots in instinct—much in the manner described on page 219.

9 Actually, this is an expedient oversimplification. My own experience at Houston bus stops leads me to think that most of the explanations and interpretations listed have a certain plausibility about them.

10 See, for example, 6.500, where this interchangeability is made explicit.

11 See page 197.
CHAPTER V

FALLIBILISM AND CERTAINTY:
A CONTEMPORARY PERSPECTIVE

In Chapter IV we saw that the two major doctrines of Peirce's working theory of knowledge, fallibilism and critical common-sensism, are derivable from Peirce's theory of meaning by utilizing virtually only such considerations as the theory of meaning is itself grounded in. Thus, whether we choose to construe the term 'pragmatism' in the narrow sense, to designate only Peirce's criterion of meaning, or whether (as I suggested at the close of Chapter III) we employ it to refer to the "neo-phenomenalistic epistemological perspective" within which the Peircean conceptions of meaning, truth, and reality intricately mesh into a molecular whole, I think we can now see that Peirce is guilty of little or no exaggeration when he expounds the claim that critical common-sensism (which again, includes the doctrine of fallibilism) constitutes a "consequence" of pragmatism. Nevertheless, even as we fold critical common-sensism snugly into the pragmatic epistemological framework, it is difficult to ignore the contrast which exists between two of the most significant tenets of critical common-sensism—namely, fallibilism and the contention that man possesses beliefs which must be
deemed 'indubitable'. If this contrast were to prove symptomatic of a real inconsistency between these two tenets, then, given their "consequential" relationship to pragmatism, it would appear that an internal contradiction must exist somewhere in the underpinnings of pragmatism itself; and this, in turn, would seem to compromise to some degree the "unity" that was ascribed to the "core concepts" of Peirce's epistemology earlier in this study. To help delineate this potentially problematic contrast in bolder relief, it will be useful to cite a highly relevant critique by a renowned epistemologist of a certain view (held by some equally renowned philosophers of science) concerning the confirmability of empirical statements.

In an article entitled "Testability and Meaning," Rudolf Carnap makes some very Peircean sounding remarks about the nature of empirical statements and the character of their confirmation:

Take for instance the following sentence "There is a white sheet of paper on this table." In order to ascertain whether this thing is paper, we may make a set of simple observations and then, if there still remains some doubt, we may make some physical and chemical experiments. Here . . . we try to examine sentences which we infer from the sentence in question. These inferred sentences are predictions about future observations. The number of such predictions which we can derive from the sentence given is infinite; and therefore the sentence can never be completely verified. To be sure, in many cases we reach a practically sufficient certainty after
a small number of positive instances, and then we stop experimenting. But there is always the theoretical possibility of continuing the series of test-observations. Therefore here... no complete verification is possible but only a process of gradually increasing confirmation.\(^1\)

Indeed, this passage could have been written by Peirce himself. Referring back to terminology coined in Chapter III, we might say that Carnap is here acknowledging that the sentence in question possesses something like external (and, perhaps, internal) generality and that, therefore, the number of sentences which describe test-instances of that sentence is without limit. Following through on this in true fallibilistic fashion, Carnap then (like Peirce) makes the point that the inductive confirmation of the original sentence must always remain incomplete, the realized test-instances forming but a finite set within the infinite set of possible test-instances. This point of view, the conclusion of which might be re-stated as 'No empirical statement is absolutely certain', has been forcefully taken to task by Norman Malcolm. Dubbing it "the Verification Argument," Malcolm attempts to demonstrate the ludicrousness of this position by setting up a homely example involving an attempt at verifying that the first four words of *Paradise Lost* are "Of Man's first dis-obedience":

I turn to the first page of verse and under the heading *Paradise Lost, Book I,*
I see that the first four words of the first line of verse are "Of Man's first disobedience." It would ordinarily be said that I had verified it. The proponents of the Verification Argument would say that I had not "completely" verified it. They would say that I had not even "completely" verified the fact that the first four words of verse on the page before me are the words "Of Man's first disobedience"... How shall I further verify it? Would it be "further verification" if I were to look again and again at this page and have more and more other people look again and again. Not at all! We should not describe it so.²

Explicitly scouting Carnap's notion of "theoretical possibility" as it relates to the verification process, Malcolm goes on to say:

It is false that "there is always the theoretical possibility of continuing the series of test-observations." It is possible that I should continue to look at the page. It is not possible that I should continue the verification of that fact because, in those circumstances, we should not describe anything as "further verification" of it. The verification comes to an end.³

Now, curiously enough, there is something Peircean, something "common-sensist," about this point of view also. We recall Peirce's injunction to "not pretend to doubt in philosophy what we do not doubt in our hearts"--an injunction that would be quite pointless if his fallibilism entails, for reasons grounded in the relation between induction and generality, that all empirical statements are more or less doubtful, i.e., not absolutely certain. Perhaps Peirce is trying to have it both ways and is
maintaining two theses whose conjunction amounts to con-
tradiction. If such is the case, the contradiction is no-
where more evident than in the following passage, in which
Peirce is commenting on the "grand central mistake" of
Descartes, i.e., the latter's "resolve" to doubt every-
thing:

(Therein). . . he deceived himself most
sadly. . . . He ought to have put him-
self to the test, and then he would
have found that many of his doubts were
purely imaginary. . . .

What happens to any veracious young
thinker is that on the first day on which
his thoughts are turned that way, he re-
marks that there are a multitude of
things that he does not doubt; and it
will not be long before he finds that
what he does not doubt, he cannot doubt,
until he meets with some definite reason
for doubting it. Let him fancy that he
doubts whether he will be alive the next
day, and though this is far from being
certain, yet he will soon catch himself
making preparations for his next day's
life without the slightest misgiving on
the subject. He may fancy he doubts
whether what he sees before his eyes be
not a hallucination; but he will probably
find himself very much indisposed to ask
another person whether or not he sees it
too, much as it concerns him to know
whether it be a hallucination or not. (Italics mine)

Peirce is telling us, on the one hand, that it is idle
pretension for an individual to construe as doubtful any
proposition which he or she does not in fact doubt—and
"there are a multitude" of such propositions--while, on
the other hand, that proposition may well be "far from
being certain." The combination of these two points yields a view statable in such terms as 'There are indubitable propositions which are far from being certain'. Actually, this is but a watered-down version of a much broader generalization; for, unifying the fallibilistic and common-sense elements of Peirce's Critical Common-sensism—and throwing in a bit of Carnapian terminology—we are confronted with a stronger claim, to the effect that 'We all possess a number of indubitable empirical beliefs, each of which lacks theoretical certainty'. Assuming this condensed statement is reasonably faithful to Peirce's view, pretty clearly we do have a self-contradictory position here or indubitability is, for Peirce, not a sufficient condition for 'theoretical' or 'absolute' certainty. However "snarled" Peirce's philosophy might seem at times, he was, I think, too polished and precise a juggler of terms to have fallen into the contradiction indicated. Therefore, let us explore the question of just what 'theoretical' or 'absolute' certainty, within the pragmatic epistemological framework, might consist in.

One "quick and dirty" way to resolve the tension between the fallibilistic and common-sense elements of Critical Common-sensism would be to cite textual evidence to reflect that the Peircean notion of absolute or theoretical certainty hinges on the concept of logical
possibility—or, more exactly, logical impossibility. Perhaps the best textual citation to employ toward that end would be a paragraph lifted from Peirce's definition and characterization of the word "knowledge" (co-authored by Christine Ladd-Franklin) in Baldwin's Dictionary of Philosophy and Psychology:

This word is used in logic in two senses: (1) as a synonym for Cognition, and (2), and more usefully, to signify a perfect cognition, that is, a cognition fulfilling three conditions: first, that it holds true for a proposition that really is true; second, that it is perfectly self-satisfied and free from the uneasiness of doubt; third, that some character of this satisfaction is such that it would be logically impossible that this character should ever belong to satisfaction in a proposition not true (5.605).

Thus, we might say, Peirce views the truth of a proposition to be absolutely certain when it is both indubitable and its contradictory is logically impossible. Aside from questions concerning the authorship and intent of the quoted passage, there nonetheless remain at least two problems with this interpretation. First of all, as Malcolm points out, if the logical possibility of any sentence, p, consists in the fact that p is not self-contradictory, such logical possibility has no direct bearing on the question of whether p is indeed true or false and, consequently, no direct bearing on the certainty of either the truth or falsity of p:
It is easy to be misled...and to conclude that from the fact that it is possible that \( p \) is false, when this means that "\( p \) is false" is not self-contradictory, that therefore it is not certain that \( p \) is true. But in... (this)...use of "It is possible"..."It is possible that \( p \) is false" only tells us what kind of statement \( p \) is. It only tells us that \( p \) is a contingent statement and not a necessary truth or a necessary falsehood. It tells us nothing about the state of evidence with respect to \( p \).

Secondly, we have the consideration that Peirce's fallibilism denies absolute certainty even to the truths of logic and mathematics (see pp. 148-151), truths whose denials possess the attribute of logical impossibility in the most obvious of senses. Given this consideration, the link between certainty and logical impossibility is rendered exceedingly obscure, and the question of what Peirce means—indeed, the question of what he can mean—by 'absolute certainty' becomes increasingly puzzling. If, on fallibilistic grounds, absolute certainty is to be denied to any and all of our beliefs, it seems legitimate to ask whether Peirce's notion of certainty is even intelligible; that is to say, the question arises of whether the Peircean notion of certainty marks off anything in the realms of either actual or conceivable experience.

Nevertheless, the matter of 'logical impossibility' is suggestive of a direction from which to approach the Peircean concept of absolute certainty. We should recall
that Peirce sees logic and logicality as involving a conceived identification with the 'unlimited community of investigators':

It seems to me that we are driven to this, that logicality inexorably requires that our interests shall not be limited. They must not stop at our own fate, but must embrace the whole community. This community...must not be limited, but must extend to all races of beings with whom we can come into immediate or mediate intellectual relation. It must reach, however vaguely, beyond this geological epoch, beyond all bounds...Logic is rooted in the social principle (2.654).

The necessity for this identification with the unlimited community stems, as we saw in Chapter III, from the fact that all meaningful propositions, on Peirce's view, have their meaning in futuro; that is, they constitute hypotheses about future experience and possess generality that is essentially open-ended. As such, the exhaustive or conclusive verification of these proposition-hypotheses must be deferred to no less an intellectual aggregation than the 'unlimited community of investigators'. On this view, 'absolute' or 'theoretical' certainty would be restricted to the final opinion of that community, and 'logical impossibility' would simply consist in the fact that the denial of any such 'absolutely certain' proposition, if acted upon by the community, could not (given the communal definition of 'truth') result in a final fixation of the community's beliefs. Clearly, this
characterization of 'certainty' is somewhat at variance with that countenanced in common parlance, but no more so than the Peircean communal definitions of truth and reality which it assumes. Furthermore, it has the virtue of postulating an objective benchmark against which the subjective certainty of individuals can be contrasted for the purpose of drawing a distinction between real knowledge and pseudo-knowledge. Thus, the seeming internal contradiction involved in the unified fallibilistic-common-sense thesis that 'We all possess a number of indubitable empirical beliefs, each of which lacks theoretical certainty' is dissolved. Indubitable beliefs are the here-and-now beliefs which we do in fact possess free from the compromising influence of doubt; theoretically (or absolutely) certain beliefs are those beliefs which would finally be settled upon—and would be settled upon as final—by the unlimited community of investigators. Queer though this community-based notion of certain might seem to some of us, it is ideally suited to express a view of certainty that has acquired a good measure of philosophical currency in recent years, namely, that the certainty of any given statement consists in its "immunity to withdrawal." By definition, the statements that would express the final opinion of Peirce's unlimited community of investigators would possess such immunity.
Although Peirce's Critical Common-sensist notion of 'absolute certainty' may be freed from the charge of manifest self-contradiction, the propriety and utility of that notion is still vulnerable to some of Malcolm's quoted criticism of Carnap's 'theoretical certainty'. A detailed analysis of Malcolm's position would lead us far afield of considerations relating to Critical Common-sensism, but some remarks supporting the plausibility of the Peirce-Carnap position seem in order in the interests of attaining a better understanding of that position. To facilitate such understanding, one more passage from Malcolm's article would be useful. With an eye to Carnap's view that, regarding the truth of empirical statements, "we reach a practically sufficient certainty after a small number of positive instances," Malcolm comments:

Some philosophers have thought that, when it is said in ordinary discourse that it is absolutely certain that so-and-so, what this means is that it is practically certain that so-and-so. This is clearly a mistake. The ordinary usage of "practically certain" is quite different from the ordinary usage of "absolutely certain." It is "practically certain" normally means "It is almost certain." To say that it is practically certain that so-and-so implies that it is not absolutely certain. "It is practically certain that p is true" implies that it that it is reasonable to have a slight doubt that p is true and implies that the evidence that p is true is not absolutely conclusive. "It is absolutely certain that p is true" implies, on the contrary, that the evidence that p is true is absolutely conclusive and implies that in the light
of the evidence it would be unreasonable
to have the slightest doubt that \( p \) is true. ⁹

Now, I think Malcolm is somewhat off base with his
univocal equation of the expression "It is practically
certain" with "It is almost certain"; for although the
word "practically" can be and often is used in the manner
he describes (as in the sentence "I practically made it to
Milford on one tank of gas"), it also has a common (and
etymologically more fundamental) use by virtue of which
it means something like "for all foreseeable intents and
purposes." Given the ease with which this second type of
use can be mistaken for the first, we often obviate
potential ambiguity by employing more bulky expressions
like "for all practical purposes" or "in practicality" or
"practically speaking" in place of the single word
"practically"; and depending on the context, there may or
may not be, in the use of such expressions, an implication
concerning the complete or incomplete realization of the
state of affairs described in the statement in which such
an expression is imbedded. When Carnap says "in many
cases we reach a practically sufficient certainty after a
small number of positive instances," I think it is much
more natural to understand his word "practically" in this
second sense and interpret his statement to mean 'In many
cases, after a small number of positive instances we reach
a level of certainty that is sufficient for all practical
purposes' (Indeed, to interpret Carnap's statement in the fashion indicated by Malcolm would yield 'In many cases we reach an almost sufficient certainty after a small number of positive instances',--a statement that immediately invites the question "Almost sufficient for what?" and renders the entire passage more puzzling than it need be.)

To fault Malcolm on this point is not exactly irrelevant nitpicking, for it is precisely this sense of 'practical certainty', I believe, that is at play in Peirce's notion of indubitable belief. If beliefs are, as Peirce portrays them, dispositions for action, then we ought to be able to discern various strata of beliefs distinguishable in terms of an individual's willingness to act in accordance with such dispositions in the achievement of the goals and realization of the desires of everyday life. We might, for instance, characterize 'practical certainty' as attaching to a belief which we would be freely willing to act upon in matters of great importance, that is, when highly undesirable results would obtain if the belief turned out to be false; conversely, practical certainty would be lacking when such willingness is lacking. Though the terminology is different, Peirce has such a distinction in mind when he contrasts 'full belief' from 'opinion' in the following passage:

We believe the proposition we are ready to act upon. Full belief is willingness
to act upon the proposition in vital crises, opinion is willingness to act upon it in relatively insignificant affairs (1.635).

On this characterization, 'full belief' is totally free of the hesitancy of doubt and would appear to meet the standards of the rather easy-going Peircean notion of 'indubitability'. As such, it is not "almost" certain in character—it is practically certain, that is, as certain as any individual's beliefs can be or need to be. And assuming the belief is rational in nature, the implication that follows—Malcolm's analysis notwithstanding—is that it is not reasonable for the individual possessing the belief to have any doubt about the truth of that belief "until he meets with some definite reason for doubting it." Peirce's 'absolute certainty' then is not to be distinguished from practical certainty ('full belief') by virtue of being untainted by doubt, for both species of certainty share this trait. What is 'absolute' about the former is the degree of evidence in which it is grounded—a degree of evidence to which only the unlimited community of investigators would be privy.

It is, of course, this question of 'degrees of evidence' that forms the heart of Malcolm's criticism of Carnap's, and by implication Peirce's, view of certainty. The Peirce-Carnap interpretation of empirical statements entails that conclusive verification of such statements
is out of the question; all we ever have is a greater or lesser degree of confirmation of these statements. Malcolm's contention, on the other hand, is that in a large number of cases "verification comes to an end" and that in such instances it would be "absurd and humorous" to describe an individual as "further verifying" a statement which he or she has already "conclusively verified." His view of the matter seems very close to that of Wittgenstein, as expressed in the following remarks:

Perhaps I shall do a multiplication twice to make sure, or perhaps get someone else to work it over. But shall I work it over again twenty times, or get twenty people to go over it? And is that some sort of negligence? Would the certainty really be greater for being checked twenty times?  

This position certainly seems to have common-sense on its side, and I think we would all tend to agree that there would at least be something silly—that is, laughably pointless, if not literally absurd—about, so to speak, beating an already verified "dead horse." In agreeing to that much, however, I think we need to note that the ludicrousness involved in such "over-verifying" is at least partially attributable to the manifest futility inherent in an individual's attempting to exorcise nonexistent doubts. To employ (and slightly rearrange) Carnap's terminology, once we reach 'sufficient practical certainty' with respect to the truth of a sentence, any
further attempts at verification (by us) naturally take on a risibly impractical and ineffectual character. Peirce, as we have seen, would be the first to ridicule such Cartesian shadow-boxing with "postulated" doubts; he would agree with Malcolm, up to a point, that there is an important sense in which the verificative process does and should come to an end:

Some people seem to love to argue a point after all the world is fully convin-ed of it. But no further ad- vance can be made. When doubt ceases, mental action on the subject comes to an end; and, if it did go on, it would be without a purpose (5.377).

But although the investigative process of adducing and analyzing evidence to eliminate any doubt concerning the truth of a given empirical statement may come to an end, the potential continued accumulation of that evidence, on the Peirce-Carnap view, does not. To better appreciate this latter claim, a simple illustration seems appropriate.

Suppose that a professional football game is being played before a crowd of 100,000 spectators and a host of cameras equipped with video tape. Late in the game, a humiliating defeat for the hometeam, the coach of the hometeam strides onto the field, approaches his team's offensive huddle, produces from his coat what looks like a handgun, and appears to fire a shot at his quarterback. The latter falls to the ground, dead of a gunshot wound. Fans and police rush the field and in the ensuing melee
the coach is arrested but the apparent murder weapon turns up missing. When the case comes up for trial the coach pleads innocent, announcing that despite all the appearances he did not shoot the quarterback. He claims to know who did commit the murder but vows that out of loyalty to the guilty party he will provide no further information on the matter either in or out of court. The local District Attorney naturally feels that he will have no difficulty in establishing the coach's guilt "beyond a reasonable doubt." He perceives that he has three types of evidence he can present in prosecuting the case: (1) chemical tests indicating that a gun was fired by the coach within a few hours of the crime, (2) sworn statements from eyewitnesses to the event, and (3) video tapes of the alleged murder. He instructs an assistant to find out the names and addresses of as many eyewitnesses as possible. Being an obsequious, energetic, and ingenious sort, the assistant returns with a comprehensive list, in alphabetical order, of the 100,000 spectators who witnessed the event. The D.A. is surprised at his assistant's level of success but smugly decides to subpoena just fifteen of the spectators to testify at the trial. Whimsically, he subpoenas the first fifteen persons on the list who have different last names beginning with the letter 'A', his assumption being that this method provides as representative a sampling of potential witnesses as would be yielded by any other "random" selection process.
The trial is held, the witnesses testify, the other evidence is brought forth, and after two minutes of formal deliberation the jury pronounces a verdict of "Guilty" upon the defendant. The case closes with the presiding judge levying a stiff fine against the coach.

If we had been serving on the jury in this hypothetical murder trial, it would (assuming the evidence to be as straightforward as I have described it) surely have been rational for us to conclude "beyond" a reasonable doubt that the coach had indeed shot the quarterback. We might say that we had reached a "practically sufficient certainty" on the matter. We might even agree, in the fashion of Malcolm, that the evidence had been conclusive, given the amount and cogency of that evidence and the fact that no evidence had been advanced to count against the thesis that the coach had done the deed. Nevertheless, although the evidence presented was conclusive in this critically important sense, was it complete? Certainly it was not all of the evidence—of the "community of spectators" only a fraction of one percent had been called in to give personal testimony. Nor was it distinguishable as the most relevant evidence available; for the District Attorney could as easily have called as his fifteen witnesses only persons whose last names began with the letter 'T', and surely their testimony would have been just as relevant and served quite as well as that of the witnesses
actually called. For the prosecution to have pursued the matter further and insisted on the testimony of all 100,000 spectators would have seemed a ludicrous gesture—virtually as ludicrous as an individual staring for minutes on end at the first page of Paradise Lost in an attempt to "further verify" the first four words of that poem—but must we say that the evidencing process "comes to an end" with the testimony of fifteen witnesses?

In view of these considerations, we would do well to distinguish between two different levels of 'conclusiveness' which might attach to confirmatory evidence. First, there is conclusiveness with respect to the rational persuasiveness of the evidence for the purpose at hand. In our hypothetical situation our purpose (as hypothetical jurors) was to establish the guilt or innocence of the accused. That purpose was well served—upon evaluating the evidence we attained practical certainty on the matter. Thus the evidence was conclusive in this first, important sense. Secondly, there is conclusiveness with respect to completeness of the evidence. In this sense, evidence may be described as having been conclusively examined only when the totality of relevant evidence has been examined. In our hypothetical example there was available evidence which was not brought forward; hence, with this second sense of 'conclusiveness' in mind, it would be legitimate for us to say that the available evidence was not conclusively
examined. It is this second sense of 'conclusiveness' that Peirce and Carnap, respectively, see as effecting "absolute" and "theoretical" certainty.

We should note, however, that with respect to our hypothetical situation there was the implication that the evidence would have been conclusive in this second sense if all 100,000 spectators had testified. This is not quite the case though, nor is it consistent with the Peirce-Carnap view of empirical statements. We must not, for instance, forget about the video tape of the alleged murder, an item of evidence whose existence helps insure that the "community of spectators" can readily be expanded indefinitely. We can easily imagine that, in years to come, persons who have heard about the crime and have become intrigued by its bizarreness might secure copies of the tape so that they can decide for themselves whether the guilt of the accused was really as obvious as it had been described to them. Of course, not all empirical statements (particularly those referring to past events) so clearly involve testing procedures—'practical consequences'—which can be projected indefinitely into the future, but on the Peirce-Carnap view such testing-procedures are always, in principle, inferable from such statements.

This matter of the indefinite and unlimited expansion of the range of evaluators of evidence merges into identity with considerations having to do with Peirce's
'unlimited community of investigators', and it is in light of such considerations that, from the Peircean point of view, the inadequacy of Malcolm's analysis of 'conclusive verification' is displayed. Malcolm hits hard at the absurdity of trying to "further verify" an empirical statement that has already been satisfactorily verified. He remarks, for example, that it would be absurd for him to try to "further verify" the first four words of Paradise Lost by continuing to stare at those words and that it "would be equally absurd if my actions consisted in showing the book to one person after another." With this latter claim, of course, Malcolm is saying that it would be absurd for him to try to further verify for himself and for his own purposes the first four words of the poem by enlisting the aid of other individuals. Clearly, however, it would not be absurd for him to offer the book to other individuals so that they might verify for themselves the fact in question. Thus, although the verification might be conclusive for Malcolm himself, in the first sense of 'conclusiveness' indicated on page 254, the verification process is plainly non-conclusive, in that same sense, for all other interested individuals who have not as yet performed the operations whose outcome would tend to confirm or falsify the proposition at issue. A childishly simple distinction is at play here but it is one that bears deeply on scientific methodology, for it involves the question of
whether special status, i.e., immunity to withdrawal, is to be accorded the observation-statements of any individual or determinate set of individuals. As Carl Hempel has posed the problem:

Shall we allow, in our rational reconstruction of science, for the possibility that certain observation reports may be accepted as irrevocable, or shall the acceptance of all observation reports be subject to the "until further notice" clause? In comparing the merits of the alternative stipulations, we would have to investigate the extent to which each of them is capable of elucidating the structure of scientific inquiry in terms of a simple, consistent theory. . . . (Various). . . considerations militate in favor of the convention that no observation report is to be accepted definitively and irrevocably. If this alternative is chosen, then not even those hypotheses which are entailed by accepted observation reports are absolutely verified, nor are those hypotheses which are found incompatible with accepted observation reports thereby absolutely falsified: in fact, in this case, no hypothesis whatever would be absolutely verifiable or absolutely falsifiable. II

From the Peircean point of view, to maintain that the process of verification may come to a close with the observations and observation-statements of any individual or determinate set of individuals is doubly problematic. First of all, as pragmatism asserts, all meaningful statements implicitly describe verificational procedures whose implementation would tend to establish those statements as being either true or false. These verificational procedures are, in principle at least, publicly accessible;
that is, they are theoretically repeatable by any number
(i.e., an unlimited number) of individuals who put them-
selves into situations appropriate for such verification.
To deny this much is, on Peirce's view (cf. pages 169-171),
to deny that there is any reality at all:

One man's experience is nothing, if it
stands alone. If he sees what others
cannot, we call it hallucination. It
is not "my" experience, but "our" ex-
perience that has to be thought of; and
this "us" has indefinite possibilities
(5.402, n.2).

If, however, we agree with Malcolm that there is a class
of empirical statements with respect to which it is
appropriate to say that "the verification comes to an end,"
it would seem that we are bound in the same breath to aver
that any further attempts at verification count for nothing
and are as irrelevant to the verification of an empirical
claim as a "thirteenth" (or "alternate") juror's opinion
is to a trial verdict arrived at by twelve "official"
jurors. Common-sense may dictate that doubtfulness comes
to an end on certain questions, but, as Peirce sees it,
the verificational process must remain open for any and
all members of the community of investigators to partici-
pate in--else we consign the notions of 'truth' and 'reality'
to unintelligibility. Secondly, to accept any empirical
sentence as having been conclusively established is to
"block the path of inquiry" by barring alternative inter-
pretations of the data that sentence describes. Though
at any given point in time such alternative interpretations might appear to be patently false, or even incon- ceivable, methodologically speaking it would seem that nothing is lost by attaching Hempel's "until further notice" clause to the imprimatur which observation stamps upon its data, while everything is gained if only occasionally the maintenance of such flexibility allows useful alternative interpretations to come into play.

In the next chapter of this paper we shall explore the matter of alternative interpretations of data as it relates to a largely overlooked area of linkage between Peirce's theory of meaning and theory of truth. To sum up the thrust of this discussion of Malcolm's criticism of the Peirce-Carnap view of certainty, however, I think it not too pernicious an oversimplification to remark that either Malcolm's own notion of certainty is very close to the Peircean concept of 'indubitability', in which case the whole dispute becomes largely verbal, or Malcolm is making a claim to the effect that a broad range of empirical statements are permanently immune from withdrawal. The latter position, once it is disentangled from con- siderations relating to the matter of what sorts of things are presently doubtful, amounts to a methodological pres- cription for the future and can be equitably assessed only in terms of its practical utility in human inquiry. I believe that it would be extremely difficult, however,
to adumbrate the lines along which an argument for such utility could be advanced. Malcolm would have done better, I think, to recognize with his mentor, Wittgenstein, that the certainty of a belief is certainty within a system of belief ("All confirmation... takes place within a system"), 12 that such a system (or nexus of 'language games') possesses a certain arbitrariness ("At the foundation of well-founded belief lies belief that is not founded"), 13 and that these systems can and do change:

If someone says that he will recognize no experience as proof of the opposite, that is after all a decision. It is possible that he will act against it. 14

Such recognition of the complexities surrounding the issue of 'certainty' is why Wittgenstein can pen the following passage (which I find Peircean both in its content and in the paradoxical flavor of its final two sentences):

"That is a tree. And that's not just surmise."

It would not be surmise and I might tell it to someone else with complete certainty, as something there is no doubt about. But does that mean that it is unconditionally the truth? May not the thing that I recognize with complete certainty as the tree that I have seen here my whole life long--may this not be disclosed as something different? May it not confound me?

And nevertheless it was right, in the circumstances that give this sentence meaning, to say "I know (I do not merely surmise) that that's a tree." To say that in strict truth I only believe it, would be wrong. It would be completely misleading to say: "I believe my name is L.W." And this too is right: I
cannot be making a mistake about it. But that does not mean that I am infallible about it. 15

If I am reading Wittgenstein correctly, he does side with Malcolm on the issue of confirmation of a belief within a system of belief. That is to say, he holds the position that the system of belief defines the validational procedures—or "rules of the game"—according to which confirmation of truth-claims made within that system takes place. According to Wittgenstein, this confirmation within the system does "come to an end," not withstanding any Peircean-Carnapian view built on a notion such as that which I have labelled 'external generality'. However, in recognizing that the system itself is subject to change—and with it the rules of the game—it seems to me that Wittgenstein is countenancing a view concerning the indeterminacy of meaning of truth-claims that is consistent with Peirce's own position regarding (what I call) 'operational generality'. If this interpretation is correct, then Wittgenstein agrees with the Peircean view that no truth-claim can reasonably be held to be permanently immune from withdrawal and that if 'absolute certainty' is to be defined in terms of such immunity, no belief held by an individual or finite group of individuals can be deemed absolutely certain.
In closing, I would like to touch on a loose end concerning Peirce's notion of 'indubitability'. Given the ease with which beliefs can qualify for the mantle of 'indubitability' on the Peircean view, the question might arise as to what purpose is served by terming such beliefs indubitable rather than simply undoubted. After all, the former term has reference to possible doubt rather than actual doubt and, as such, would seem better reserved for marking off the theoretically certain beliefs of the 'unlimited community' rather than the fallible beliefs of existing human beings. As the quoted passage on page implies, however, Peirce uses the term indubitable to distinguish from merely undoubted beliefs such beliefs as would remain undoubted upon reflection until some definite reasons for doubting them are confronted. Use of the inflexion '-able', then, serves for Peirce to hammer home his anti-Cartesian view that we cannot will ourselves into a state of doubt and that beliefs remain entrenched until some reason triggers the "irritation" of doubt.
NOTES TO CHAPTER V


2 Ibid., pp. 53-54.

3 Ibid., p. 54.


5 I am referring to the questions, first, of how much of the Dictionary article is Peirce's and how much Ms. Ladd-Franklin's, and secondly, whether Peirce—if he was the sole author of the relevant passage—hewed down his own views on the matter to make them compatible with what he perceived to be standard philosophical usage—an understandable gesture given the context.

6 Malcolm, op. cit., pp. 33-34.

7 That is to say, theoretical or absolute certainty, on the Peircean analysis, seemingly must involve the community's self-awareness that they know that a statement in question has been conclusively (i.e., finally) established as true. (In other words they must know that they know that p.) For example, I might believe the sentence "Unicorns have never existed"; that sentence might well be true, and as true would be a sentence believed by the unlimited community of investigators. That would—be coincidence of my belief with the unlimited community's, however, does not now render my belief absolutely or theoretically certain.


12 Wittgenstein, op. cit., p. 16.


CHAPTER VI

PRAGMATISM AND THE DOCTRINE OF
THEORY-DEPENDENT MEANING

In Chapter IV and V, we probed the two main doctrines of Peirce's working epistemology, fallibilism and critical common-sensism, from two different but related angles. We first considered the manner in which each doctrine is anchored in the same conceptual benthos as Peirce's pragmatic theories of meaning and truth, theories which in Chapter III we saw to be inextricably interwoven. We then went on, in Chapter V, to explore and at least superficially resolve the tension which seemed to exist between the two doctrines in question. It will be noticed that, although other considerations entered into the discussion, our analyses of both fallibilism and critical common-sensism relied heavily upon our characterization of pragmatic sign-interpreta tion as being essentially a special case of abductive inference—a characterization which in turn took into account the functional dependence of abduction upon induction and its attendant notions of generality and community. In the present chapter I propose to further exploit the abductive-inductive connection as the unifying factor in Peirce's interrelated theories of meaning and truth by employing it to reflect a hitherto largely
overlooked manner in which those theories entail a certain view concerning the relation of the meaning of individual terms to the truth-claims in which those terms are embedded.

One of the most thought-provoking debates to arise in the philosophy of science in recent years centers around the question of whether the meanings of non-syncategorematic terms employed in scientific theories are determined by the content of those theories. The view that such meaning-determination does take place I will refer to in the following pages as "the doctrine of theory-dependent meaning." This doctrine, as it usually finds expression, may be enunciated in a little more detail in something like the following manner:

The descriptive terms (both observational and theoretical) used by a science undergo a shift in meaning when incorporated into, or used in conjunction with, a theory; thus the principles of a theory help determine the meanings of the terms occurring in them, and so the meanings of such terms will vary from theory to theory; hence changes in theory result in changes of meaning.\footnote{1}

Although adumbrations of this doctrine had been articulated earlier, it found its most celebrated expression in 1962 with the publication of T. S. Kuhn's *The Structure of Scientific Revolutions*\footnote{2}; and proponents of the doctrine, in one version or another, have included such individuals
as N. R. Hanson, Stephen Toulmin, P. K. Feyerabend, and David Bohm. The doctrine appears to have at least as many variant forms as it has adherents, and debate among its major proponents has tended to be as lively and heated as the debate between the doctrine's advocates and critics. The following three theses, however, seem common to most "strong" versions of the doctrine:

(a) Observations and the terms which describe observations are 'theory-laden'; that is, there are no theory-neutral observations or observational terms.

(b) Inscriptionally identical theoretical terms possess different meanings when employed in different theories.

(c) Scientific advancement occurs through the total replacement of one theoretical framework by another, rather than through the cumulative accretion of knowledge typically associated with the reduction of one theory to another, more comprehensive, theory.

Pretty clearly, theses a and b (which might well be mergible into one broad homogeneous thesis, as in the passage just quoted, depending on the theory of meaning from which they spring) may be construed as claims having crucial significance for epistemology as well as science.
Thesis c could be construed as either a sociological insight into the character of actual scientific development or as a methodological prescription for such development, but to the extent that it is derivable from either a or b it too must be interpreted as an epistemological claim.

In his book *Science and Subjectivity*, Israel Scheffler, a staunch critic of the doctrine of theory-dependent meaning, describes the epistemological relationship of the content of c to that of a and b:

It seems to follow...that we cannot literally speak of alternative theories of the same domain, nor of comparing these theories to see which gives a better account of the empirical facts within this domain. For there is not, and there cannot be, a neutral account of the domain in question, since the observational derivations of each theory differ in meaning from those of the other, no matter how similar they are simply as sound patterns. Nor can one law really be absorbed into another through a process of reduction, nor observational content passed on from one theory to its successor, for crucial meaning changes have occurred in the process of transfer. We have here... (a)....paradox, the paradox of common language, and its upshot is that there can be no real community of science in any sense approximating that of the standard view, no comparison of theories with respect to their observational content, no reduction of one theory to another, and no cumulative growth of knowledge, at least in the standard sense.  

In that same book, Scheffler, aside from finding the doctrine of theory-dependent meaning odious on account of its putatively subjectivist implications, cites the Peircean
view of truth and reality as being the very antithesis of that doctrine. Keying on the matter of the cumulativeness of knowledge, Scheffler, in relating Peirce and the doctrine of theory-dependence, remarks:

Finally, with cumulativeness gone, the concept of convergence of belief fails, and with it the Peircean notion of reality as progressively revealed through scientific advance. For there is no scientific advance by standard criteria, only the rivalry of theoretical viewpoints and the replacement of some by others. Reality is gone as an independent factor; each viewpoint creates its own reality.

In place of the notion of Peirce that scientific convergence of belief is to be interpreted as a progressive revelation of reality, we are now to take such convergence as a product of rhetorical persuasion, psychological conversion, the natural elimination of unreconciled dissidents, and the retraining of the young by the victorious faction. Instead of reality's providing a constraint on scientific belief, reality is now seen as a projection of such belief, itself an outcome of non-rational influences. The central idealistic doctrine of the primacy of mind over external reality is thus resuscitated once again, this time in a scientific context.

Now Scheffler, in enlisting Peirce as a comrade-in-arms against the "subjectivist" proponents of the doctrine of theory-dependent meaning, is not the first to note the apparent incompatibility between the Peircean and theory-dependence perspectives, and certainly the contrast between the two viewpoints does seem obvious enough. Nevertheless, I believe that the issue, as it relates to
Peirce, is somewhat more complex than Scheffler and others make it out to be, and I think that the failure to appreciate that complexity is to some extent grounded in failure to perceive the intricacies of the interdependence obtaining between Peirce's theories of meaning and truth. (Indeed, Scheffler, for example, has elsewhere remarked upon that apparent "inconsistency" between the Peircean notion of truth and pragmatic theory of meaning.\textsuperscript{11}) In the following pages, I will try to develop a case, based on insights gained in previous chapters of this paper, for interpreting the Peircean epistemological perspective as entailing a version of the doctrine of theory-dependent meaning. For clarity's sake it will be expedient to structure this case around the three key tenets of that doctrine cited on page

(a) Theory-laden Observation. As we saw in the first section of the previous chapter, Peirce's notion of observation includes, but is by no means limited to, that of sense perception. It is, for example, broad enough to encompass such non-sensuous activities as introspective contemplation of mathematical constructs. Indeed, "the noting of. . . anything. . . to which our attention is directed in advance of our noting it, is called Observation" (7.115n), and the results of awareness of activities in the 'Inner World' of experience have as much right, on
the Peircean analysis, to be deemed 'observations' as do their sensory counterparts garnered from attentiveness to the 'Outer World' of experience. Although the range of possible observations thus is far greater in breadth than that of sense perceptions, Peirce's account of observation almost perfectly parallels his analysis of the latter. Observations, like sense perceptions, are to a significant extent affairs of secondness; that is, they are products of the reaction (perhaps more precisely, they consist in the reaction) between ego and non-ego, between observing subject and observed object:

For what is observation? What is experience? It is the enforced element in the history of our lives. It is that which we are constrained to be conscious of by an occult force residing in an object which we contemplate (5.581).

As seconds, as reaction-phenomena, observations, like sense perceptions, are peculiarly individual (we might say 'monadic'), impenetrable, and so, incorrigible:

... a reaction has an individuality. It happens only once. If it is repeated, the repetition is another occurrence, no matter how like the first it may be. It is anti-general (7.538).

... observations are most varied and are never exactly repeated or reproduced so that they cannot constitute that settled opinion to which investigation leads. ... Observations are for every man wholly private and peculiar. And not only can no man make another man's observations, or reproduce them; but he cannot even
make at one time those observations which he himself made at another time. They belong to the particular situation of the observer, and the particular instant of time (7.331).

This matter of incorrigibility of observations involves a point that is at once both trivial and epistemologically important. It is trivial in the sense that what is being noted is something like the following: 'Since an observation is a unique, non-repeatable experience, it cannot be repeated and corrected'. It is epistemologically important because it draws attention to the fact that in and of themselves observations have no cognitive significance; that is to say, their cognitive significance is acquired through their subsequent interpretation via the mediation of other thought-signs. As present phenomena, observations are as nothing, for "the only thought that is really present to us is a thought which we can neither think about nor talk about" (7.425). Observations become cognitively significant only as past phenomena interpreted by future thought-signs:

.. . . . Besides observation it must be that there is also an elaborative process of thought by which ideas given by observation produce others in the mind. . . .

.. . . . What does it mean to say that two thoughts are alike? It can only mean that any mind that should compare them together, would pronounce them to be alike. But that comparison would be an act of thought not included in the two observations severally; for the two observations existing at different times, perhaps in
different minds, cannot be brought together to be compared directly in themselves, but only by the aid of the memory, or some other process which makes a thought out of previous thoughts, and which is, therefore, not observation. Since, therefore, the likeness of these thoughts consists entirely in the result of comparison, and comparison is not observation, it follows that observations are not alike except so far as there is a possibility of some mental process besides observation (7.331–7.332).

Now there are two very significant epistemological consequences that flow from the Peircean analysis of observation. First of all, there is the fallibilistic point (discussed in Chapter IV) that observations and observation statements have no special claim to absolute certainty. They are indeed **incorrizable** in a sense, but it is precisely in that same sense that they are without cognitive significance. The postulation of the atomic observational 'given', unalloyed by the base metal of subjective interpretation, and so, immune to fallibility, is seen for what it is—a pernicious philosophical myth whose main practical value is obstructionist insofar as it would block the patch of inquiry by holding a certain class of statements to be above criticism. Secondly, we see that, on the Peircean account, observations are meaningful only to the extent that they address themselves to the "community of thought-signs" which constitute their interprer- tants. Thus, the putatively separate and elemental acts
of observation, communication, and interpretation are to be construed as bound up inextricably in one fluid process, no element of which can ever really be dissociated from the other two. Peirce's position here is extremely close to David Bohm's view that perception and communication are, in an important way, one and the same phenomenon:

I want to emphasize that scientific research does not consist of first looking at something and then communicating it. Rather, the very act of perception is shaped and formed by the intention to communicate, as well as by a general awareness of what has been communicated in the past, by oneself and by others. Even more, it is generally only in communication that we deeply understand, that is, perceive the whole meaning of, what has been observed. So there is no point to considering any kind of separation of perception and communication. Perception and communication are one whole, in which analysis into potentially disjoint elements is not relevant. To indicate this, I use the hyphenated form, perception-communication.12

The upshot of this identification of observation with communication and interpretation is that, on the Peircean analysis, there is no theory-neutral observation; for observation is meaningful only insofar as it is interpreted within the framework of the previously existing body of knowledge ('interpretant-cognition' we might call it) which the observer brings to it. To minimize redundancy in further explicating this point, however, I would like to move on for a moment to examine another (closely related) sense, relevant to the theme of this chapter, in which
Peirce's views on observation coincide with his account of sense perception.

In Chapter IV (see especially page 197) I made the rather sweeping (but I hope sound) generalization that from the Peircean point of view all judgments possess a marked abductive character by virtue of the necessary presence of an intrinsic interpretational aspect. Even if we were of a mind to back down from such a broad claim, I think we would still want to hold fast to that characterization as at least true of observational judgments. Looking back to Chapter II and our initial discussion of abductive inference, we should recall Peirce's schematic model of perceptual abductions:

A well-recognized kind of object, M, has for its ordinary predicates $P_1$, $P_2$, $P_3$, etc., indistinctly recognized. The suggesting object, S, has these same predicates, $P_1$, $P_2$, $P_3$, etc. Hence, S is of the kind M. (8.64)

Pretty clearly this model is just as applicable to observational judgments—i.e., "perceptions" of objects in either the 'Outer' or 'Inner' worlds of experience—as it is to perceptions of the obviously sensory variety. So, to put it simply, observations are but a special class of abductive inference. Working with this characterization we can now profitably employ some points made in Chapter IV to gain a better understanding of the epistemological dynamics of
Peircian observation.

As a species of abductive inference, observation should reflect what in Chapter IV (see especially pages 211-214) I described as the 'creative' and 'conservative' elements of abduction. Now, the creative element of course is simply the abductive conclusion itself, the interpretative construction which the act of observation places upon the object of its attention. Sensory observation (which some might think is the least inferential of all mental activities) provides us with some of the most dramatic examples of such 'creative' abductive interpretation:

Does the reader know of the blind spot on the retina? Take a number of this journal, turn over the cover so as to expose the white paper, lay it sideways upon the table before which you must sit, and put two cents upon it, one near the left-hand edge, and the other to the right. Put your left hand over your left eye, and with the right eye look steadily at the left-hand cent. Then, with your right hand, move the right-hand cent (which is now plainly seen) towards the left hand. When it comes to a place near the middle of the page it will disappear—you cannot see it without turning your eye. Bring it nearer to the other cent, or carry it further away, and it will reappear; but at that particular spot it cannot be seen. Thus it appears that there is a blind spot nearly in the middle of the retina; and this is confirmed by anatomy. It follows that the space we immediately see (when one eye is closed) is not, as we had imagined, a continuous oval, but is a ring, the filling up of which must be the work of the intellect (5.220).

Here the role of interpretation vis-a-vis observation is
not wholly unrelated to, but may be viewed as different from, the manner in which interpretation was described as interacting with observation on page 27. What we described there was the necessity for the observational experience to address itself to the interpreting mind of the observer, and the claim involved there was strong enough to entail that uninterpreted observational experience is without cognitive significance. However, that way of looking at the matter, taken by itself, suggests the picture of a chain of interpretative thought-signs reaching back to a regrettably inaccessible but purely observational (i.e., non-interpretative) experience. If the analysis were left at that level, there might remain room for a view to the effect that there is such a thing as a "pure" observational experience but that it is something akin to a ding-an-sich; that is, we can meaningfully refer to it but, alas, we can never describe it with total accuracy, for the very act of description adulterates the observation by introducing a distorting interpretational element. (And so, perhaps, the "pure" observation, though never fully recoverable, could somehow be approximated had we but the wit to know how to eliminate some of the links in the chain of interpretation leading back to it.) In the above 'blind spot'-example, however, Peirce is offering a construal of observational experience that wholly undercuts this ding-an-sich-like view by averring that observation not merely necessarily
gets interpreted but also that observation is interpretation.
In the following passage (which refers to a line drawing I
will not attempt to re-create) this way of construing ob-
servation is perhaps even more apparent. The drawing,
according to Peirce, appears from one perspective to be
merely a serpentine line while from another perspective it
is clearly a representation of a stone wall:

The point is that there are two ways of
conceiving the matter. Both, I beg you
to remark, are general ways of classing
the line, general classes under which the
line is subsumed. But the very decided
preference of our perception for one mode
of classing the percept shows that this
classification is contained in the per-
ceptual judgment. So it is with that
well-known unshaded outline figure of a
pair of steps seen in perspective. We
seem at first to be looking at the steps
from above; but some unconscious part of
the mind seems to tire of putting that
construction upon it and suddenly we seem
to see the steps from below, and so the
perceptive judgment, and the percept it-
self, seems to keep shifting from one
general aspect to the other and back again.

In all such visual illusions of which
two or three dozen are well known, the
most striking thing is that a certain
theory of interpretation of the figure
has all the appearance of being given in
perception (5.183).

Thus, rather than observational experience consisting in
the grafting of an interpretation upon a pure "observation-
in-itself," to have an observation is to employ a theory
of interpretation in an observation-related way. As N. R.
Hanson (in an analysis of visual observation) frames the
matter:

It seems to me pointless to adopt the cogs-and-wheels, wires-and-pulleys accounts of some philosophers on this issue. There is no question...of putting visual grist into the intellectual mill. We do not begin with the visual sensation and only then turn our theories and interpretations loose on it. In a most important way our theories and interpretations are in the seeing from the outset... (The) interpretation is a component of the seeing, and not an operation tandem to the seeing.14

On the Peirce-Hanson analysis, observation is a special variety of hypothesis-formation, and to engage in observation is to employ a 'theory of interpretation' that renders the object of the observational experience intelligible. To paraphrase an expression of John Dewey's,15 we might say that this analysis construes observational experience to be more a matter of 'takens' rather than 'givens'. This is the 'creative' side of observational abduction that I was alluding to a moment ago; and we might also say that it is the fallibilistic side, for to construe observation as essentially interpretative, essentially hypothetical, is to implicitly embrace a fallibilistic view of observation (to the exclusion, for example, of the Malcolmian 'I couldn't-possibly-be-wrong-about this'-view). But just as fallibilism and critical common-sensism are two sides of the same epistemological coin, Peirce's (and Hanson's) view of observation is common-
sensist to much the same extent that it is fallibilistic, and observational experience is 'conservative' at the very same moment it is 'creative'. For if observation is inferential (primarily abductive), and if "inference is the process by which one belief determines another" (7.354), then observation, with its built-in 'theory of interpretation', must have its character determined by something in the nexus of beliefs which the observer brings to the experience. Even in simple sense perception, the most rudimentary and least obviously cerebral mode of observation, "we perceive what we are adjusted for interpreting" (5.185); and in observation-in-general we observe what we observe as the result of the mental set, the habits of thought—the beliefs—which we bring to the observation. To Peirce, there is no "neutral," belief-free mental set through which we assimilate the so-called "raw data" of experience, any more than there are belief-free beliefs. The only neutral mind is an empty mind:

Philosophers of very diverse stripes propose that philosophy shall take its start from one or another state of mind in which no man, least of all a beginner in philosophy, actually is. One proposes that you shall begin by doubting everything, and says that there is only one thing that you cannot doubt, as if doubting were "as easy as lying." Another proposes that we should begin by observing "the first impressions of sense," forgetting that our very percepts are the results of cognitive elaboration. But in truth, there is but one state of mind from which you can "set out," namely, the very state of mind in which you actually find yourself at the
time you do "set out"—a state in which you are laden with an immense mass of cognition already formed, of which you cannot divest yourself if you would; and who knows whether, if you could, you would not have made all knowledge impossible to yourself? (5.416)

As Hanson puts it:

This is part of Goethe's meaning when he says that we see only what we know. New visual phenomena are noteworthy only against our accepted knowledge of the observable world. In psychologists' language, we are set to see, observe, notice, or attend to certain sorts of things, but not others. The ancient Greeks failed to notice thousands of things about the world that children now regard as commonplace, but this was not due to faulty vision or lack of curiosity. Galen's followers did not see that the middle wall of the heart was usually solid and not perforated. Physicists up until 1900 failed to detect the flaw in Galileo's proof that the acceleration of a freely falling body was proportional to the time and not the distance fallen.

...(Seeing)...is, hence, a theory-laden operation...and hence relative in most respects to the observer's knowledge. It is this knowledge which in large measure affects what the observer will see things as.16

In light of our discussion thus far, it appears that we must interpret Peirce as responding in the affirmative with respect to the question of whether observations and observational statements are indeed 'theory-laden'. We have yet to explore the issue of the theory-dependency of observational terms but, given the considerations that will be brought forward in dealing with thesis b (page 267) of the doctrine of theory-dependent meaning, I think we will
be warranted in consolidating the treatment of both theoretical and observational terms within the confines of the next section of this chapter.

(b) Meaning changes. In Chapter I of this paper we encountered a trichotomy, that of term-proposition-argument, which had some relevance to the most obvious relationship obtaining between Peirce's notions of meaning and truth. We saw (page 66) that Peirce attached great logical significance to the purported insight that terms are but elliptical forms of propositions and that propositions in turn are but elliptical forms of arguments. The first phase of this triadic equation, the identification of terms with propositions, comports beautifully with pragmatism's method of explicating the meanings of terms by means of indicating their capacity for functioning in truth-claims and specifying the conditions under which those truth-claims would be verified. If we probe this parallel between pragmatism and the term/proposition/argument equation further, I believe we will be able to uncover some implications of Peirce's theory of meaning which are highly relevant to the focus of this chapter, the doctrine of theory-dependent meaning. To aid in this undertaking it might be useful to take an indirect approach to the matter by erecting something of a philosophical straw man, a loosely-contrived doctrine of theory-independent
meaning, and attempt to pick it apart by employing the
term/proposition/argument equation and certain other
Peircean views we have met with in various contexts.

Perhaps because it is obvious that a proposition may
be meaningful but not true, and just as obvious that we can
understand and entertain a proposition without holding any
opinion as to either its truth or falsity, some
philosophers have been inclined to suggest that a
proposition's content may be prescinded from its assertion-
al aspect.\textsuperscript{17} A different but closely-related inference
from the conceptual distinction to be drawn between meaning-
ascriptions and truth-claims might proceed thus: Since
truth-claims are constructed by the fitting together of
meaningful terms, meaning must be logically prior to—and
conceptually independent of—the business of truth-claim
making. A corollary from this conclusion is that the mean-
ing of any given term is fixed independently of any truth-
claim or set of truth-claims involving that term. On this
view then, the meaning of any term would be said to be
theory-independent. There is certainly an intuitive appeal
to this view, and a superficial examination of everyday
discourse seems to confirm it. For instance, when someone
tells me "The Astros just lost another baseball game," I
can readily understand the meanings of the terms involved
without hypothesizing whether or not he is telling me the
truth. To carry the example to extremes (just to make sure
there are no broad "philosophical" theories at work) I can understand the meaning of the statement in question and its constituent terms even if I have the sceptical reserve to refrain from theorizing as to whether there is any team known as the "Astros," any game that has ever been played called "baseball," and in fact any human being actually telling me that the Astros just lost again. Hence it appears that the meanings of both statements and their constituent terms are theory-independent.

Plausible though this position might seem, from the Peircean point of view it has things backwards. Individual terms are indeed the building-blocks out of which statements are constructed. However, the important point to be drawn from this consideration is not that terms are somehow logically prior to statements within some hierarchy of meaningfulness, but rather that terms are meaningful only to the extent that they function in truth-claims. The term 'man', for example, "if it can be said to mean anything by itself, means 'what I am thinking of is a man'." (3.440) A block that is not used for building is not a building block, and a term that is circumscribed from participation in an assertional context ceases to be a meaningful linguistic entity. Such is the general thrust of the following passage (occasioned by Peirce posing the question of what linguistically important difference obtains between the two expressions, "speaking monkey" and "monkeys speak"): 
In the first place, it is to be remarked that the first expression signifies nothing. The grammarians call it an "incomplete speech." But, in fact, it is no speech at all. As well call the termination ability--or actionally an incomplete speech. It is also to be remarked that the number of languages in which such an expression is possible is very small. In most languages that have nouns and adjectives, the participial adjective follows the noun and when left without other words the combination would mean the monkey is speaking.

In such languages you can't say "speaking monkey," and surely it is no defect in them; for after it is said, it is pure nonsense. . . . Even in Indo-European speech the linguists tell us that the roots are all verbs. It seems that, speaking broadly, ordinary words in the bulk of languages are assertory. They assert as soon as they are in any way attached to any object. If you write GLASS upon a case, you will be understood to mean that the case contains glass (4.56).

Thus, the Peircean view of the logical relationship of terms to propositions seems to undercut the "building-block" premise of the simplistic doctrine of theory-independent meaning sketched above. Nevertheless, although (if the Peircean analysis is correct) we have damaged the feet of our straw man, his head and body seem unscathed, for we have yet to show how all this negatively impacts upon the view that the meanings of terms have no significant dependence upon beliefs or theories about the world. It is, after all, one thing to admit that terms draw their meaning from their fitness to function in sentential contexts (expressive of beliefs or theories) and quite another thing
to say that they draw their meanings from specifiable sets of sentential contexts. The statements "Monkeys speak" and "Monkeys do not speak," for example, are clearly contradictory (and so, expressive of incompatible beliefs or theories), yet the meaning of the term 'monkey' seems just as clearly to be exactly the same in both sentential contexts. We might be inclined to agree with Peirce that "every new concept first comes to the mind in a judgment" (5.546) and with Carl Hempel that "concept formation and theory formation go hand in hand,"¹⁸ without thereby committing ourselves to a view that the use of a term expressive of a concept involves acceptance of the truth of (or even understanding of) the judgment or theory which was the occasion of its generation. But let us pursue this matter of the relation of terms to sentential contexts a bit further.

It appears that there are what, for lack of a better word, we might call tacit "rules" for putting the building-blocks of language, its terms, into sentential structures. The meaningful use of any term in a sentential context takes place upon the presupposition that its use in that context is in accordance with these rules—that is, there is a range of contexts in which the term may be meaningfully employed and a range in which it may not. The rules of which I am speaking are in turn grounded in the presupposition that the referent of a given term is limited
with respect to the range of properties which it can take on. Thus, the general type of rule in question is intended to mirror the rules of organization which obtain in the world. When the broadest species of this sort of linguistic rule is violated we are confronted with what some philosophers have called a category mistake.19 (Examples of such a mistake are "Null sets are always red," "The sun is much larger than the number 2," etc. Null sets are simply not the sort of things of which color terms are predicable, and the only senses in which the sun and numbers can be said to be large are literally incomparable.) When a speaker makes an obvious category mistake the natural response of a listener is not likely to be "He's wrong" or "What he's saying is false," but rather something like "What the devil is he talking about?" or "The poor fellow doesn't know how to use the language." In short, category mistakes tend to be unintelligible.

Now there are violations of the aforementioned "linguistic rules" which we might not want to dismiss as category mistakes, that may or may not result in unintelligibility, but which are violations nevertheless. One instance of such a violation would be the statement "That table just winked at me." Assuming we know that the speaker is not joking, we might respond to this unusual assertion with "No--tables are not the sort of things that wink at people. Perhaps something that looks like a table
did--or appeared to--wink at you; but if you really were winked at, it was not a table that did it." We have been presented here with an assertion that (interpreted sympathetically) is not quite unintelligible but which most of us would agree is a misuse of language (except perhaps in humorous, poetical, or mystical contexts). Although the ability or inability to wink is not explicitly taken into account in any dictionary definition of 'table', we none-theless would insist that if something is a table it will not wink. Things that we commonly and erroneously believe to be tables might wink, but if such were found to be the case we would introduce into our language a new term to designate these winking table look-alikes.

Of course, the appeal here to an un-polled "we" might appear to be a questionable tactic; and accordingly the suggestion could be raised that the ability to wink is in itself not a dramatic enough property to warrant the introduction of a new term in this case. We could, after all, simply work with the distinction between tables that wink and tables that do not wink. Though there might be merit in such a suggestion in this particular case, a proposed generalization of this procedure over all similar cases would betray a misunderstanding of the point of our example. In any particular case of a new and astonishing property found to be possessed by a table look-alike, we can indeed agree to continue to use the term 'table' to refer to what
were previously called 'tables' and to their look-alikes.

Never to draw a line somewhere, however—that is, to admit that any and all properties may be possessed by tables—would be to consign the term 'table' to the limbo of meaninglessness. (Or, if not absolutely meaningless, the term 'table' would merely mean something like 'thing' or 'object of thought'.) As the example was designed to show, to describe the meaning of any given term is to indicate the possible future determinations of behavior of the referent of that term. (To paraphrase W. V. O. Quine, it is illusory to think that we can determine separately what to talk about and what to say about it.)

Thus, the "linguistic rules" which determine and delimit the range of sentential contexts in which descriptive terms may appear are at the same time, functionally speaking, generalizations concerning the behavior of objects in the world. As such, they constitute working points of view, or theories, about that world. And since, to function meaningfully, all descriptive terms must remain subject to these rules, the meanings of all such terms can be legitimately construed as being theory-dependent.

Although the above line of argument unfolded without explicit mention of Peirce, I think a bit of scrutiny will expose its Peircean underpinnings, for the theory of meaning which serves as its ground is peculiarly pragmatic in character. In speaking of the 'possible future
determinations of behavior, of the referent of a term we were really describing, in a slightly embroidered fashion, the conceived 'sensible effects' or 'practical consequences' attributable to the referent of the term; and it is distinctions in such 'behavior' or 'effects' or 'consequences' that, from the pragmatic point of view, mark off and constitute the distinctions to be drawn between the meanings of any given terms. It is an important trait—to Peirce one of the most important traits—of the pragmatic theory of meaning that it represents the attribution of meaning to a term as involving us in a form of commitment to conditional generalizations about the world:

A most pregnant principle, quite undeniably, will this "kernel of pragmatism" prove to be, that the whole meaning of an intellectual predicate is that certain kinds of events would happen, once in so often, in the course of experience, under certain kinds of existential conditions. . . . (5.468).

This is the heart of Peirce's 'conditional idealism', but more interestingly for our present context, it is also the heart of his 'scholastic realism'. One reason Peirce saw nominalism to be essentially confused is that it fails to note the manner in which generalizations are inescapably built into our descriptive vocabulary; hence, to nominalistically deny that there are 'real generals' is, by implication, to resolve to stop using language. In a discussion of the Humean analysis of causality, A. J. Ayer
has alluded to this manner in which descriptive terms steep themselves in generalizations that are at once existential and logical in character:

For the most part we describe objects or events at least partly in terms of their actual or potential relations to other objects or events, and very often these descriptions include a tacit or explicit reference to their causal properties. Thus, a pen is something that you write with, a chair is something that can be sat on, a table is something that supports things, a match is something that produces flame when it is suitably struck, fire lights and warms, books can be read, mirrors reflect, umbrellas are waterproof... This is why it is misleading to say, as I sometimes have, that Hume proved that causality was not a logical relation. For if these words are taken...as implying that no causal statements are logically true, they state what is actually false. In any case in which a causal property enters into the definition of a kind of thing, the causal statement in which this property is ascribed to things of that kind will be logically true.21

Before we move on to discuss certain other features of what I am alleging to be Peirce's theory-dependent view of meaning, I think it might be well to discard a distinction alluded to earlier which figures prominently in discussions of the doctrine of theory-dependent meaning—the distinction between observational and theoretical terms. In the just-quoted passage, Ayer says that "almost all the familiar kinds of objects" are defined in terms of causal relationships. Peirce's pragmatic theory of meaning, as we have seen, is somewhat more categorical in its pronouncement
on this issue. For Peirce, all descriptive terms, be they deemed theoretical or observational, are definable in the relational 'If . . . , then . . .' language of practical consequences. Thus, it would seem that within the framework of the pragmatic theory of meaning no special provision is made for sorting out meanings according to an observational/theoretical dichotomy. Moreover, in light of the conclusion of the first section of this chapter, that Peirce construed observation and observational statements as theory-laden, there is reason to think that Peirce found the observational/theoretical distinction to be, if not meaningless, somewhat misleading and of limited conceptual utility.

In discussing Peirce's views on observation (page 278) I said that his position involves the thesis that observation not only necessarily gets interpreted but that observation is interpretation. We might discern something of a parallel in considering the pragmatic theory of meaning's implications concerning the relationship of meaning-ascriptions and truth-claims. I think it fair to say, in light of considerations brought forth in the past few pages, that Peirce's theory of meaning entails the view that not only do terms possess their meanings by virtue of a requisite capacity for functioning in truth-claims, but that the ascription of meaning to a term involves the
presumption of the truth of any number of generalizations (truth-claims) about the would-be referents of that term. Thus, our theories about the world determine the meanings of our terms, and we in turn employ those terms to frame further, more tentative, hypotheses about the world. (To revert to our winking table example, working from the framework of a nexus of tacit generalizations about tables --e.g., 'Tables don't wink', 'Tables have legs', 'Tables don't vote in national elections', etc.--we go on to formulate other claims about tables, e.g., 'That table is green', 'Oaken tables are sturdier than balsa-wood tables', etc.) I think we can detect here the influence of two old and close-related friends of ours, Peirce's theory of abduction and his critical common-sensism. As we have seen so often before, abductive inference, hypothesis-formation, permeates every phase of the thought-process, and here we find it invading and controlling the sacristy of our very meanings, that quiet retreat within which we might have deemed ourselves to be safe from the secular concerns of the competitive world of truth-claim construction. The recognition of this abductive hegemony once again points to the "common-sensist" core of critical common-sensism; for just as in truth-claim construction we work from a base of commitment to a (largely unreflective) body of already accepted beliefs, so too in meaning-ascription we work from a similar (though not identical) body of beliefs. It is
not easy to say what distinguishes the belief-base of truth-claims from that of meaning-ascriptions, but I think a well-known passage from Quine's "Two Dogmas of Empiricism" is suggestive of the answer:

The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric which impinges on experience only along the edges. Or, to change the figure, total science is like a field of force whose boundary conditions are experience. A conflict with experience at the periphery occasions readjustments in the interior of the field. . . . Re-evaluation of some statements entails re-evaluation of others, because of their logical interconnections—the logical laws being in turn simply certain further statements of the system, certain further elements of the field. . . . But the total field is so underdetermined by its boundary conditions, experience, that there is much latitude of choice as to what statements to reevaluate in the light of any single contrary experience. No particular experiences are linked with any particular statements in the interior of the field, except indirectly through considerations of equilibrium affecting the field as a whole.22

To mangle an already straining metaphor, it seems to be the case that meaning-ascriptions and their attendant beliefs are the conceptual pivots from which we map out and organize the structure of the "field" of our totality of beliefs. As such, they tend to lie near the center of that field and are less subject to alteration or withdrawal than the more clearly "factual" beliefs which lie along the
field's periphery. Their special organizational function does not, however, confer upon them an immunity to amendment or withdrawal, nor does it render them void of factual reference—any more than a vector-diagram is immune to correction or devoid of empirical significance. In their organizational capacity these belief-permeated meaning-ascriptions take on a virtually metaphysical character; that is to say, their instrumental utility lies as much or more in their 'illuminative' value as in their 'predictive' value. To wax metaphorical again, they are the blades with which we slice reality into assimilable pieces. And, as an interlocking set of conceptual "blades," our nexus of meaning-ascriptions may properly be described as constituting a metaphysical framework or world-view which structures our ontology and determines the character our beliefs and corresponding truth-claims will take on. We should keep in mind, however, that the relationship between this framework and the body of our beliefs is reciprocal; for our beliefs hone the blades which section out our beliefs.

Whether or not these remarks about the similarity of a system of meaning-ascriptions to a system of metaphysics appear convincing, it definitely is the case that Peirce viewed empirical beliefs in general, and scientific theories in particular, as governed by metaphysical considerations. His position was not, of course, that each of us has an explicitly thought-out set of metaphysical doctrines in the
manner of a Leibniz or Bradley, but rather that we do each possess a largely instinctive network of highly general beliefs into which we intercalate our newly-emerging, typically more specific, beliefs. The challenge to both science and general human inquiry is not whether to be influenced by metaphysics, but rather, given its unavoidable influence, to maximize our critical awareness of that metaphysics which shapes and directs our factual beliefs:

(The) . . . special sciences are obliged to take for granted a number of most important propositions, because their ways of working afford no means of bringing these propositions to the test. In short, they always rest upon metaphysics. At one time, for example, we find physicists, Kelvin, Maxwell and others, assuming that a body cannot act where it is not, meaning by "where it is not" where its lines of force do not centre. At another time, we find them assuming that the laws of mechanics (including the principles of metric geometry) hold good for the smallest corpuscles. . . . Find a scientific man who proposes to get along without any metaphysics. . .and you have found one whose doctrines are thoroughly vitiated by the crude and uncriticized metaphysics with which they are packed. We must philosophize, said the great naturalist Aristotle— if only to avoid philosophizing. Every man of us has a metaphysics, and has to have one; and it will influence his life greatly. Far better, then, that that metaphysics should be criticized and not be allowed to run loose (1.129).

As it relates to the special sciences (i.e., "sciences that discover new phenomena" (5.125.) Peirce's view of the dominance of metaphysics comports well with his order of the classification of the sciences (cf. pages 9–12),
in which metaphysics is schematically prior to the special sciences and is depicted as providing some of the 'fundamental principles' upon which those sciences depend. There is, however, a more clearly epistemological rationale for remarking the metaphysical dependence of those sciences, and it has to do with the critical common-sensist insight that our newly-emerging beliefs do not spring forth out of an intellectual vacuum but rather are midwifed into existence and nurtured in their development by the set of relevant prior beliefs which we bring to any particular area of inquiry:

That we ought to experiment without preconceived ideas is one of those vague logical maxims which characterize the loose reasoner. An experiment has been well called the putting of a question to Nature, which she answers mostly by "no" or "yes." To have no preconceived idea in experimentation is to take an interrogatory position without putting any definite question... Unless there be some truth in our hereditary metaphysics, unless the nature of the mind is such that the right idea will be developed at last, unless the number of utterly wrong guesses that we should ever make is finite, no number of questions, however large, will bring us measurably nearer the truth than we were at the outset.24

There are at least three interrelated points of interest broached in the quoted passage. First, there is the contention that experiments are significant only from the perspective of the theoretical posture which we bring to them. Secondly, there is the characterization of this
posture as a "hereditary metaphysics." If we do not attach too narrow an interpretation to the term 'hereditary', I think we can justifiably conjecture that Peirce is here referring to a nexus of largely instinctive beliefs ('instinctive', that is, in the broad sense described in Chapter IV of this study) and construing that nexus of beliefs as constituting a world-view. And thirdly, we have an allusion to the role of this instinctive world-view in successful hypothesis formation. As we saw in Chapter IV, this role is describable in terms of the symbiotic relationship existing between the abductive and inductive modes of inference; that is to say, our instincts initially arise as abductions, are reinforced inductively, and thereby take their place within the conceptual framework which we employ to generate further abductions. Fused together, these three points may, I think, be viewed as constituting an epistemologically grounded (as opposed, say, to socio-logically (grounded) Weltanschauung analysis of theory construction and interpretation—-theories and their constituent descriptive terms being parasitic in content upon the world-view which served as the source of their generation. It is interesting to notice that Frederick Suppe has used the expression 'Weltanschauung analysis' to describe the philosophical view I have been referring to as 'the doctrine of theory-dependent meaning', and that Peirce's own position, as just characterized, seems to fit
in well with Suppe's general description of the Weltanschauung analysis point of view:

...such an analysis must give serious attention to the idea that science is done from within a conceptual perspective which determines in large part which questions are worth investigating and what sorts of answers are acceptable; the perspective provides a way of thinking about a class of phenomena which defines the class of legitimate problems and delimits the standards for their acceptable solution. Such a perspective is intimately tied to one's language which conceptually shapes the way one experiences the world. . . . Theories are interpreted in terms of the Weltanschauung; hence to understand theories it is necessary to understand the Weltanschauung. 26

If I am correct in the contention that Peirce's critical common-sensism involves a Weltanschauung analysis of theory construction and interpretation, and if I am also correct with respect to the point made a few pages back, that Peirce's pragmatic theory of meaning entails the view that the meaning of both observational and theoretical terms is theory-dependent, then it would seem that we ought to be able to find in his writings some semblance of the doctrine of theory-dependent meaning's tenet that inscriptionally identical descriptive terms possess different meanings when employed in different scientific theories. As it turns out, indications of this thesis can be found in Peirce's writings, and they may be seen to be linked to what I earlier described as the 'operational generality' attaching to the meanings of terms. As our theories about
the world change, the 'operations' or 'practical consequences' by means of which we conceptually map out that world change; hence, our meanings change:

Perception is the possibility of acquiring information, of meaning more; now a word may learn. How much more the word electricity means now than it did in the days of Franklin; how much more the term planet means now than it did in the time of Hipparchus. These words have acquired information; just as a man's thought does by further perception. . . . In fact. . . men and words reciprocally educate each other; each increase of a man's information is at the same time the increase of a word's information and vice versa (7.587).

Granted, we do not find Peirce fully capitalizing on this point and tracing out its implications in the manner of present-day philosophers of science. We do not, for instance, find him dealing with the issue of the alleged 'incommensurability' of the meanings of inscriptionally identical terms appearing in different theories. But then, if Peirce had anticipated the current debates centering around the doctrine of theory-dependent meaning, pigeonholing his pragmatic epistemology in relation to that doctrine would call for little in the way of interpretative analysis, and the main points I have been pushing in this chapter, if correct, would by now have become cliches within the field of Peirce scholarship.
(c) **Scientific Revolutions.** Thus far, in roughly structuring this chapter around the three theses of the doctrine of theory-dependent meaning cited on page 26, we have seen, first, that Peirce's view of observation pretty clearly construes observation as being 'theory-laden', and secondly, that the pragmatic theory of meaning seems to entail the view that descriptive terms draw their meanings from the theories in which they are embedded, so that when the meaning of a theory changes, the meanings of its descriptive terms change. Conceding as I did, with respect to this second point, that the implications of this pragmatic version of the doctrine of theory-dependent meaning failed to be traced out by Peirce, it might seem futile to consider any relationship between thesis _c_ on page 26 and Peirce's own views; for thesis _c_ appears to be a facet of a much more finely cut version of the doctrine than can legitimately be ascribed to Peirce. Moreover, the quoted remarks of Scheffler appearing on pages 268 and 269, even if they can be interpreted as misleadingly attributing an overall anti-theory-dependence view to Peirce, superficially appear to be right on the money with respect to the fundamental incompatibility of thesis _c_ and the Peircean epistemological view of truth and reality. Nevertheless, in the remaining pages of this chapter I will argue for the position that thesis _c_, far from being incompatible with basic Peircean epistemology, accords well with the theory
of inference at the heart of that epistemology and finds expression in certain of Peirce's comments on scientific methodology.

It seems to me that the assumption of incongruity between thesis c of the doctrine of theory-dependent meaning and Peirce's pragmatic definitions of truth and reality is attributable in part to a misplaced emphasis on the conceptual interplay obtaining between those definitions and Peirce's theory of induction. Now, I would be the last person in the world to deny the importance of such interplay—indeed, much of the content of Chapter III of this paper consisted in an analysis of the interdependence of Peirce's notions of truth, reality, and inductive methodology. However, too simplistic an emphasis on the inductivist ingredients in Peirce's epistemology, coupled with a failure to perceive that Peirce's theory of induction is of one cloth with his theories of abduction and deduction, has for example occasioned a misleading caricature of Peirce's views in James Bryant Conant's book, Two Modes of Thought. Having distinguished between what he terms the 'empirical-inductivist' and 'theoretical-deductive' modes of thought, Conant depicts himself and Kuhn as proponents of the latter and represents Peirce as being a leading advocate of the former. To Conant, the 'empirical-inductivist' approach is embraced by "those who demand certainty in a
secular world view," and he describes and dismisses the alleged Peircean position in the following manner:

The view that the correct scientific laws and theories are the limiting cases toward which our scientific developments inevitably trend was held by Charles S. Peirce. It represents a more cautious and critical formulation of a popular belief that science was concerned with discovering the real structure of the universe, of solving a puzzle, as it were, to which there is only one answer. My own view is that even the cautious statement of Peirce goes beyond the historical evidence. Scientific revolutions involve such a drastic reorientation of a scientist's way of thinking that the idea of a continuous process over long periods of time can hardly be maintained.27

The piling up of narrow empirical generalizations does not assure the emergence of generalizations wide enough to serve as scientific theories. Only rarely have new empirical-inductive generalizations played a critical role in the striking advance of science.28

To identify Peirce with a secular quest for certainty is, I think, to evidence a fundamental misreading of the old fallibilist, and this misreading carries over into Conant's characterization of Peirce's stance concerning the nature of scientific change and development. Far from seeing the business of science as consumed in the inductive activity of "the piling up of narrow empirical generalizations," Peirce possessed a fairly sophisticated—and quaintly idiosyncratic—view of scientific process and progress, which we will now briefly examine.
Peirce grafted his views on scientific development to a more general view concerning the validity and widespread applicability of 'the theory of evolution of species':

The evolutionary theory in general throws great light upon history and especially upon the history of science—both its public history and the account of its development in an individual intellect (1.103).

The particular version of the theory of evolution to which Peirce subscribed is actually a synthesis of three different theories which had some currency in the Nineteenth Century. Characteristically, he construed those three theories as exemplifying, respectively, his own three phaneroscopic categories. In categorical order, the three theories in question may be capsularly profiled as follows:

(1) **Darwin's theory**—the view that "the entire interval from Moner to Man has been traversed by successive purely fortuitous and insensible variations in reproduction" (1.104).

(2) **Charles King's theory of 'cataclysmic evolution'**—the view that "species are unmodified or scarcely modified under ordinary circumstances, but are rapidly altered after cataclysms" (6.17). Thus, evolution occurs through "external forces and the breaking up of habits" (Ibid.).
(3) J. B. Lamarck's theory---the view that the "development of species has taken place by a long series of insensible changes" which "have taken place in the lives of the individuals, in consequence of effort and exercise, and that reproduction plays no part in the process except in preserving these modifications" (6.15). Lamarckian evolution, broadly speaking, is "evolution by the effect of habit" (6.16).

Just as Peirce believed that each of these theories correctly described an operative mechanism in the evolution of species (each being false only to the extent that it purported to constitute a fully comprehensive description), so he felt that each theory had a close analogue applicable to the domain of the evolution of science. The first mode of such evolution, the 'Darwinian', is of the least interest to our present discussion, and in reference to it I will simply cite an illustration given by Peirce:

(A). . .sort of Darwinian evolution undoubtedly does take place. . .in science. We are studying over phenomena of which we have been unable to acquire any satisfactory account. Various tentative explanations recur to our minds from time to time, and at each occurrence are modified by omission, insertion, or change in the point of view, in an almost fortuitous way. Finally, one of these takes such an aspect that we are led to dismiss it as impossible. Then, all the energy of
thought which had previously gone to the consideration of that becomes distributed among the other explanations, until finally one of them becomes greatly strengthened in our minds (1.107).

Of greater relevance both to Conant's characterization of the Peircean view of scientific development and to thesis c of the doctrine of theory-dependent meaning are Peirce's comments on the scientific analogues of 'cataclysmic' and 'Lamarckian' evolution. It takes little imagination, after all, to see that, with reference to the three types of evolution cited, the scientific parallel of cataclysmic evolution would be the 'scientific revolutions' (or, as Kuhn also calls them, the 'paradigm changes') associated with the doctrine of theory-dependent meaning, while Conant's Peirce ought to emphasize the centrality of the role of a Lamarckian-style scientific evolution—an evolution effected through virtually "insensible steps," a "piling up of narrow empirical generalizations."

Peirce's Peirce, however, reads a different history (and logic) of science than Conant's Peirce, and he describes the role of Lamarckian evolution in science as follows:

Lamarckian evolution might, for example, take the form perpetually modifying our opinion in the effort to make that opinion represent the known facts as more and more observations came to be collected. . . . Yet, after all, it does not play a prominent part in the evolution of science. The physical journals. . . publish each month a great number of new researches. Each of these is a distinct contribution to science. It represents
some good, well-trained labor of observation and inference. But as modifying what is already known, the average effect of the ordinary research may be said to be insignificant. Nevertheless, as these modifications are not fortuitous but are for the most part movements toward the truth...there is no doubt that from decade to decade, even without any splendid discoveries or great studies, science would advance very perceptibly. We see that it is so in branches of physics which remain for a long time without any decisive conquests... 

But this is not the way in which science mainly progresses (1.108-109, italics mine.).

It is, rather, to 'cataclysmic evolution', the replacement of one broad theoretical framework by another, that Peirce turns for his primary explanation of scientific development:

(Science). . .advances by leaps; and the impulse for each leap is either some new observational resource, or some novel way of reasoning about the observations. Such novel way of reasoning might, perhaps, be considered as a new observational means, since it draws attention to relations between facts which would previously have been passed by unperceived (1.109).

He sees the breakthroughs of Pasteur, occasioned by the use of (then) novel observational methods, as constituting a classic example of the manner in which such theoretical frameworks collide and the very ontology of science changes:

The microscope showed. . .(that certain ferments). . .were due to living organisms, which Pasteur began studying. At that time the medical world was dominated by Claude Bernard's dictum that a disease is not an entity but merely a sum of symptoms. This was pure metaphysics which only
barricaded inquiry in that direction. But that was a generation which attached great value to nominalistic metaphysics. Pasteur began with the phylloxera. He found it influenced the "optical activity" of the sugar. This pointed to a ferment and therefore to an entity. He began to extend the doctrine to other diseases. The medical men, dominated by the metaphysics of Claude Bernard, raised all sorts of sophistical objections. But the method of cultures and inoculation proved the thing, and here we see new ideas connected with new observational methods and a fine example of the usual process of scientific evolution. It is not by insensible steps (1.109).

The fact that Peirce comes down on the side of 'cataclysmic evolution' as the predominant factor in scientific development should not really surprise us by now, Conant's remarks notwithstanding. We have seen in a variety of contexts in this paper that the subtleties of Peirce's theory of inference can be adequately appreciated only if we view the three separate modes of inference as essentially interactive, and of special interest throughout our last few chapters has been the interaction which, on the Peircean view, obtains between abduction and induction. Implicit in Peirce's view is the point that induction is the slave of abduction—and ought to be. Induction is employed to confirm (or refute) the conclusions of abduction; inductions, in other words, are pointless without abductions which, at once, give direction to inductions and are in turn sustained by the latter's confirmational reinforcement. Take any induction whatever, and, on the Peircean
view, you will see that "that induction must have been
based upon a theory which the induction verified" (5.591).
To Peirce, science is involved in the "piling up of narrow
empirical generalizations" chiefly when it is operating
within the more or less static framework of a given
toory. At such times, advancement is relatively minimal.
It is only when the theoretical framework which governs the
question of which "narrow empirical generalizations" to
"pile up" is radically altered or replaced that science
truly evolves. In the above-quoted passage concerning
'cataclysmic evolution and the work of Pasteur, Peirce makes
reference to the metaphysical foundation of the theory
which Pasteur shattered. In so doing, he is simply giving
expression to the critical common-sensist view (alluded to
in the previous section of this chapter) that the 'special
sciences' take for granted a Weltanschauung, a world-view
which both feeds into and feeds off the particular theories
generated within those sciences. And as our world-view
changes, the world-as-we-know-it, by definition, changes:

Modern science, with its microscopes and
telescopes, with its chemistry and
electricity, and with its entirely new
appliances of life, has put us into quite
another world; almost as much so as if
it had transported our race to another
planet. Some of the old beliefs have no
application except in extended senses, and
in such extended senses they are sometimes
dubitable and subject to just criticism
(5.513).
Thus, in spirit at least—and in an interesting coincidence of imagery—Peirce's position on 'cataclysmic evolution' in science is not all that far removed from Kuhn's characterization of 'scientific revolutions':

Led by a new paradigm, scientists adopt new instruments and look in new places. Even more important, during revolutions scientists see new and different things when looking with familiar instruments in places they have looked before. It is rather as if the professional community had been suddenly transported to another planet where familiar objects are seen in a different light and are joined by unfamiliar ones as well. . . . In so far as their only recourse to that world is through what they see and do, we may want to say that after a revolution scientists are responding to a different world.

In closing this chapter, it is only appropriate that we should take note of some loose ends that are a bit difficult to neatly tie into place. We have seen that Peirce's account of scientific change favors the view that such change occurs chiefly through the replacement of one theoretical framework by another—rather than by the agglutination of simple facts or "narrow empirical generalizations"—and that that account can be construed as being an outgrowth of Peirce's critical common-sensism. Nevertheless, there is a distinctive feature of Peirce's epistemology that is hard to bring into line with some of the thrust of the doctrine of theory-dependent meaning: namely, his joint definition of 'truth' and 'reality' in
terms of a "predestined" settlement of opinion on the part of the unlimited community of investigators. Kuhn could well have the Peircean notion of truth in mind when, in the concluding remarks of *The Structure of Scientific Revolutions*, he says:

> The developmental process described in this essay has been a process of evolution from primitive beginnings—a process whose successive stages are characterized by an increasingly detailed and refined understanding of nature. But nothing that has been or will be said makes it a process of evolution toward anything. Inevitably that lacuna will have disturbed many readers. We are all deeply accustomed to seeing science as the one enterprise that draws constantly nearer to some goal set by nature in advance.

> But need there be any such goal? Can we not account for both science's existence and its success in terms of evolution from the community's state of knowledge at any given time? Does it really help to imagine that there is some one full, objective, true account of nature and that the proper measure of scientific achievement is the extent to which it brings us closer to that ultimate goal?  

In *Word & Object*, Quine advances a somewhat related, explicit criticism of Peirce that is also worth quoting:

Peirce was tempted to define truth outright in terms of scientific method, as the ideal theory which is approached as a limit when the (supposed) canons of scientific method are used unceasingly on continuing experience. But there is a lot wrong with Peirce's notion, besides its assumption of a final organon of scientific method and its appeal to an infinite process. There is a faulty use of numerical analogy in speaking of a limit of theories, since the notion of limit depends on that
of "nearer than," which is defined for numbers and not for theories. And even if we by-pass such troubles. ... still there is trouble in the imputation of uniqueness ("the ideal result"). For ... we have no reason to suppose that man's surface irritations even unto eternity admit of any one systematization that is scientifically better or simpler than all possible others. It seems likelier, if only on account of symmetries or dualities, that countless alternative theories would be tied for first place. Scientific method is the way to truth, but it affords even in principle no unique definition of truth.32

To do justice to these remarks, especially Quine's, would call for a depth of treatment that would take us off on more tangents than I think we need or want to roam at this late juncture in our study. Therefore, I will restrict myself to some extremely cursory comments concerning those remarks and will limit these comments to three considerations culled from the quoted passages.

First of all, it seems implicit in Kuhn's quoted remarks that Kuhn sees a Peercean-style goal-directed notion of science as entailing a 'cumulative accretion' view of scientific development. There is a possible ambiguity involved in use of the term 'cumulative', however, that should be spoken to here. On the one hand, an interpretation of scientific development as proceeding mainly by way of 'cumulative' growth could hinge on the portrayal of science as a simple piling up of narrow facts and generalizations. Kuhn's own definition of 'cumulative
process' as "articulation or extension of," an existing 'paradigm', or theoretical framework,\textsuperscript{34} seems expressive of this sense of 'cumulative'. I hope we have satisfactorily established in the last several pages that Peirce does not see this type of 'cumulative process' as being a predominant factor in scientific growth. Nevertheless, there is indeed a sense of 'cumulative' in which it would be proper to pin that tag to Peirce's view of scientific growth, but I am not at all sure that it is a sense which Kuhn should find inappropriate for describing such growth. To Peirce, scientific advancement is essentially "cumulative" in nature to the extent that it is a building on what went before--and "what went before" is normally a structure which has wholly or partially collapsed:

In storming the stronghold of truth one mounts upon the shoulders of another who has to ordinary apprehension failed, but has in truth succeeded by virtue of the lessons of his failure. This is the veritable essence of science (7.51).

Even Kuhn acknowledges that scientific revolutions are occasioned by that which went before, that is, the breakdown of the 'paradigms' previously accepted by the scientific community:

Scientific revolutions are inaugurated by a growing sense, . . . often restricted to a narrow subdivision of the scientific community, that an existing paradigm has ceased to function adequately in the exploration of an aspect of nature to which that paradigm itself had previously led the way.\textsuperscript{35}
Secondly, there is the matter of the teleological characterization of inquiry involved in the Peircean notion of truth. Kuhn finds such reference to "a process of evolution toward anything" to be both groundless and pointless. Yet he himself, in the same passage, depicts science as a "developmental process...of evolution...whose successive stages are characterized by an increasingly detailed and refined understanding of nature," and it is not altogether clear exactly what distinguishes his own notion of 'developmental process' from the process of truth-seeking countenanced in the epistemologies of both Peirce and—I think—the "man on the street." If he is taking issue with a view of truth that is not definable in terms of 'refinement of understanding', Peirce is not his adversary:

You only puzzle yourself by talking of this metaphysical "truth" and metaphysical "falsity," that you know nothing about. All you have any dealings with are your doubts and beliefs, with the course of life that forces new beliefs upon you and gives you power to doubt old beliefs (5.416).

For truth is neither more nor less than that character of a proposition which consists in this, that belief in the proposition would, with sufficient experience and reflection, lead us to such conduct as would tend to satisfy the desires we should then have. To say that truth means more than this is to say that it has no meaning at all (5.375, n.2).

If Peirce's pragmatic conception of truth, as I have indicated in previous chapters, makes truth out to be 'universal workability of belief', then the process toward
truth might aptly be described as 'increased workability of belief'—or, in Kuhnian terms, 'increasingly detailed and refined understanding'.

Finally, we have an issue on which Kuhn's and Quine's quoted remarks converge, namely, the matter of the "uniqueness" of the final opinion of the community as "some one full, objective, true account of nature." With respect to the 'fullness', or completeness, of an account of nature, I do not think that Peirce can rightly be charged with maintaining that such is possible, much less that it is the goal of scientific inquiry. Quite to the contrary, he says:

However much we know, more may come to be found out. Hence, all can never be known. This seems to contradict the fact that nothing is absolutely incognizable; and it really would do so if our knowledge were something absolutely limited. For, to say that all can never be known, means that information may increase beyond any assignable point; that is, that an absolute termination of all increase in knowledge is absolutely incognizable, and therefore does not exist (5.330).

Regarding the question of the 'uniqueness' of truth, I am afraid it would be extremely difficult to build a case reflecting that Quine has oversimplified Peirce's position. We might argue that "the" final opinion of the community could itself be composed of a multiplicity of theories, some of which constitute alternative explanations of overlapping domains of phenomena, and each of which
possesses 'universal workability'; but the weight of textual evidence supports the view that Peirce consciously ruled out such a position. In dropping the matter then, I will simply cite a somewhat enigmatic remark (appearing in Peirce's review of a book of essays by one T. E. Thorpe) which may or may not indicate that Peirce seriously entertained other ideas:

Dr. Thorpe has no other explanation to offer of Priestley's adherence to phlogiston than the old one, that Priestley was incapable of placing himself in an unwonted point of view. We doubt whether the history of Priestley's opinions in metaphysics and theology sufficiently supports that explanation. There seems to be something worth considering in another view that has been broached, namely, that the vitality of the doctrine of phlogiston was, in some occult or subtle manner, due to the circumstance that it was true in its way.36
NOTES TO CHAPTER VI


8 Ibid., p. 19.

9 Ibid., pp. 73-74.

10 See, for example, James Bryant Conant's *Two Modes of Thought* (New York, Trident Press, 1964), esp. pp. 13-17. Conant is generally approving of the central theses in Kuhn's *The Structure of Scientific Revolutions* (a book dedicated to Conant) and utilizes what I take to be a grossly distorted interpretation of Peirce's view of inductive methodology to highlight the contrast between Kuhn's and Peirce's ideas concerning scientific growth.
11 Scheffler, Conditions of Knowledge (Chicago, University of Chicago, 1965), p. 43.


13 The following passage is somewhat similar in thrust:

When the ground is covered by snow on which the sun shines brightly except where shadows fall, if you ask any ordinary man what its color appears to be, he will tell you white, pure white, whiter in the sunlight, a little greyish in the shadow. But that is not what is before his eyes that he is describing; it is his theory of what ought to be seen. The artist will tell him that the shadows are not grey but a dull blue and that the snow in the sunshine is of a rich yellow (5.42).

14 Hanson, Perception and Discovery (San Francisco, Freeman, Cooper and Co., 1969), pp. 88-89. Actually, Hanson has some reservations about use of the term 'interpretation' in this context (see p. 87 and p. 131), but they do not really bear on the issue we are discussing.

15 "The history of the theory of knowledge or epistemology would have been very different if instead of the word 'data' or 'givens', it had happened to start with calling the qualities in question 'takens'. John Dewey, The Quest for Certainty (New York, Capricorn Books, 1960), p. 178.


17 For example, see p. 2 of Translations from The Philosophical Writings of Gottlob Frege (Op. cit.).


19 E.g., Gilbert Ryle in The Concept of Mind (New York, Barnes and Noble, 1949), p. 16.


In any case in which we want to make the claim that two properties are invariably associated, we can always make sure of the association by expanding the definition of the first property so that it includes the second. This is badly put, because in a strict sense it is no longer the same property that one is defining. . . . Very often this operation passes almost unnoticed because the changes are gradual and the connotations of the terms one is dealing with are anyhow not very clearly delimited. Consider, for example, the changes that have taken place even in the meaning of terms like 'water' as our knowledge, or what we take to be our knowledge, has increased. Do we now mean the same by the term 'water' as the Greeks meant. . . . Well, yes and no. If you look up 'water' in the Oxford English Dictionary, you will find under heading II, 'the substance of which the liquid "water" is one form among several; the chemical compound of two volumes of hydrogen and one of oxygen (H₂O)'. This is not a definition that the Greeks could have given.


This 'illuminative' vs. 'predictive' terminology appears in Peirce's review of a book on the philosophy of Auguste Comte, p. 170 in Charles Sanders Peirce: Contributions to The Nation; Part Three, op. cit. Peirce attributes the terminology to Comte.


25 Indeed, at least once in his writings (8.158) Peirce uses the very term 'Weltanschauung' to refer to the
metaphysical base which the special sciences of physics and psychology presume.

26 Suppe, op. cit., p. 126. It is especially interesting that in a footnote to the quoted passage Suppe describes the Weltanschauung analysis approach as being "heir to the philosophical tradition which includes Nietzsche. . .Peirce. . .C. P. Lewis. . .Quine." (Ibid.) He does not, however, explain his reference to Peirce, and it seems possible that all he has in mind is Peirce's oft-repeated characterization of science as the "life of a social group" (7.52), i.e., a Lebenswelt. On the page from which the quoted passage is culled Suppe seems to equate the meanings of the expressions 'Weltanschauung' and 'Lebenswelt'.


28 Ibid., p. 17.

29 Peirce's characterization of 'Lamarckian evolution' in science corresponds rather nicely to what Kuhn describes as the activity of 'normal science':

In this essay, 'normal science' means research firmly based upon one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time as supplying the foundation for its further practice (Op. cit., p. 10).

Normal science, the puzzle-solving activity we have just examined, is a highly cumulative enterprise, eminently successful in its aim, the steady extension of the scope and precision of scientific knowledge (Ibid., p. 52).

30 Ibid., p. 6.

31 Ibid., pp. 169-170.


33 Kuhn, op. cit., p. 84.
Identifying Kuhn's 'paradigms' with 'theoretical frameworks' might seem an inappropriate extension of the meaning of 'paradigm', inasmuch as in the Preface to his book he defines 'paradigms' as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners." Nevertheless, Kuhn's notion of 'paradigm' is a rather fluid one, and I think 'theoretical framework' captures some of the meaning of his varying use of the term. Cf. Margaret Masterman's "The Nature of a Paradigm" in Criticism and the Growth of Knowledge, ed. by Imre Lakatos and Alan Musgrave (Cambridge, Cambridge University Press, 1970), pp. 59-89.

Kuhn, op. cit., p. 91.

Charles Sanders Peirce: Contributions to the Nation; Part Three (op. cit.), p. 89.
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