Popper and rationality a Wittgensteinian critique.

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LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L'AVONS RECEUE
POPPER AND RATIONALITY:
A WITTGENSTEINIAN CRITIQUE

by
William Burns Hutchinson

A Thesis
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TABLE OF CONTENTS

ABSTRACT ....................... iv

INTRODUCTION .................. 1

CHAPTER

I. KARL POPPER ON THE CONCEPT OF RATIONALITY .... 3
   Footnotes ...................... 16

II. WITTGENSTEIN ON THE CONCEPT OF JUSTIFICATION .... 17
   Introduction ................... 17
   1. The request for justification of
      inductive inferences has no sense. 18
   2. The language-game of justification
      precludes the request for justifi-
      cation of inductive inferences . 35
   Summary ........................ 40
   Footnotes ...................... 43

III. WITTGENSTEIN ON THE CONCEPT OF RULE ........... 45
    Introduction ................... 45
    1. Wittgenstein's investigations into
       what it is to follow a rule. 47
    2. Wittgenstein's explanation of what
       it is to follow a rule .......... 65
    Summary ........................ 73
    Footnotes ...................... 76

IV. GROUNDS, CERTAINTY, AND PRACTICE ............ 79
    Introduction ................... 79
    1. Karl Popper's idea of a rationality
       arises from a misunderstanding of
       the concept of justification .... 79
    2. This leads him to offer a prescrip-
       tion for rationality that is not
       credible ........................ 85
    Summary ......................... 94
    Footnotes ...................... 97

POSTSCRIPT ...................... 98
   Footnotes ..................... 102

BIBLIOGRAPHY .................... 103

VITA AUCTORIS ................... 104
ABSTRACT

POPPER AND RATIONALITY:
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William Burns Hutchinson

The purpose of this thesis is to appraise Karl Popper's concept of rationality. It is Popper's contention that the use of inductive inferences for reasoning about the world is fundamentally irrational. I argue that from a Wittgensteinian perspective Popper's reasoning on the subject of rationality is confused. As a result of this confusion, I further argue that Popper's conclusions on what is rational are untenable.

The method of appraisal is composed of three steps. First, Popper's position on rationality is explicated by formulating two statements, $P_1$ and $P_2$. $P_1$ is intended to reflect what Popper thinks is not rational behaviour and $P_2$ is intended to reflect what Popper thinks is rational behaviour. Both statements are then criticized, using some of Ludwig Wittgenstein's logical insights as the basis of analysis. Finally, the conclusions reached as a result of the criticisms of $P_1$ and $P_2$ are reviewed in an attempt to explain the roots of Popper's confused reasoning.
I argue in conclusion that man is in no danger of being characterized as irrational because he uses inductive inferences to make certain cognitive claims.
INTRODUCTION

It is Karl Popper's belief that he has solved the traditional philosophical problem of induction. Popper believes this because he claims to have discovered and solved the problem behind the traditional philosophical problem of induction. That is, Popper thinks that behind the problem of justifying man's belief in statements such as "The sun will rise tomorrow" lies the problem of rationality. Man can only be rational, Popper holds, if he can justify his belief in statements like the preceding one. Given that it is logically impossible to justify inductive inferences, Popper attempts to solve the traditional philosophical problem of induction by offering a method of justification which can be used to establish beliefs as rational.

In response to Popper, I argue two things. One, there is no problem behind the traditional philosophical problem of induction. Two, Popper's belief that there is such a problem leads him to offer a method of justification which does not fulfill its task. I attempt, then, to demonstrate the following thesis:

Karl Popper's idea of rationality arises from a misunderstanding of the concept of justification; this leads him to offer a prescription for rationality that is not credible.
On the basis of the defence of the above proposition, I conclude with some positive remarks on understanding the concept of rationality.
CHAPTER I

KARL POPPER ON THE CONCEPT OF RATIONALITY

Introduction

The following is an explication of Karl Popper's idea or conception of rationality. Popper's characterization of what is "rational" comes out of considerations he makes when he offers his solution to the traditional philosophical problem of induction. For Popper, the traditional philosophical problem of induction is embodied in Hume's attempt to justify common sense notions such as: "The sun will rise tomorrow because it has repeatedly done so in the past."

What is at stake, for Popper, is man's rationality.

The explication will be divided into three sections. The purpose of the first section will be to explicate what Popper thinks the "problem" of the problem of induction is. The purpose of the second section will be to outline Popper's solution to the problem of induction. The purpose of the third section will be to formulate a summary of what Popper's idea of rationality is.

Section 1

Popper states that his purpose in the first chapter
of **Objective Knowledge** is to formulate the problem which is inherent in the traditional philosophical "problem of induction." Popper writes:

My main task ... will be to formulate ... the problem which I think lies behind what I have called the traditional philosophical problem of induction. **OK, p. 2**

As a result of formulating, or reformulating, the traditional problem of induction, Popper believes that he is in a position to offer a solution. He states that it "... was the fact that I reformulated the traditional philosophical problem which made its solution possible."¹ The traditional philosophical problem of induction, Popper states, is the following: "What is the justification for the belief that the future will be largely like the past? Or, perhaps, what is the justification for inductive inferences?" (**OK, p. 2**).

The problem that Popper thinks underlies the traditional philosophical problem of induction is arrived at by noting a "clash" between two separate problems of induction. Popper thinks these problems are implicit in Hume's search for a justification of common sense belief. The one problem Popper calls the logical problem of induction and the other problem he calls the psychological problem of induction. Popper formulates these problems as follows:
Are we justified in reasoning from [repeated] instances of which we have experience to other instances [conclusions] of which we have no experience? OK, p. 4.

Why, nevertheless, do all reasonable people expect, and believe, that instances of which they have no experience will conform to those of which they have experience? That is, why do we have expectations in which we have great confidence? OK, p. 4.

The clash Popper refers to can be explained in the following manner. To H_L Popper agrees with Hume that the answer must be: No. To H_PS, Popper notes that Hume answers: "...Because of 'custom or habit'; ... by repetitions and by the mechanism of the association of ideas..." ²

The clash is this: On the one hand, reasonable people have strong expectations of the future conforming to the past, but on the other hand, because H_L has to be answered in the negative, there can be no justification from a logical point of view for these expectations. There can be no justification, according to Popper, because there is no principle of induction (i.e., induction is a "myth"), nor can one be formulated.

For Popper, the principle of induction, if one can be discovered, would necessarily be a synthetic statement. That is to say, it could not be a logical truth (i.e., tautology or analytic statement). If the principle of induction were a logical truth, then the logical inferences would be deductive as opposed to inductive. Thus, the truth of the principle of induction must necessarily
be known from experience.

Popper states, though, that "... any attempt to base the principle of induction breaks down, since it must lead to an infinite regress." That is to say, the principle of induction must be both a synthetic statement and a universal statement. Thus, to justify a principle of induction inductive inferences would have to be used. In order to accomplish this an inductive principle of a "higher order" would necessarily have to be assumed, ad infinitum for every attempt at a justification of a principle of induction. Induction, then, for Popper, is a myth.

Since there can be no justification for our inductive inferences, Popper concludes, by noting Hume, the following about our "knowledge":

[Hume's] result that repetition has no power whatever as an argument, although it dominates our cognitive life or our "understanding," led him to the conclusion that argument or reason plays only a minor role in our understanding. Our "knowledge" is unmasked as being not only of the nature of belief, but of a rationally indefensible belief—of an irrational faith. OK, pp4-5.

Hence, the "problem" of the traditional problem of induction, as Popper sees it, is that man's cognitive activities are, at root, irrational. That is to say, there can be, from a logical point of view, no way to justify even the most commonsensical beliefs that man holds; for instance, "that the sun will rise tomorrow." In effect,
Popper tells us that if a person were to hold the belief that "the sun will not rise tomorrow" he would be just as reasonable, or just as rational, as any other person holding any other belief about any other thing. For example, he quotes Bertrand Russell as putting Hume's conclusion "... even more forcefully and desperately...".

Hume's philosophy ... represents the bankruptcy of eighteenth-century reasonableness ... It is therefore important to discover whether there is any answer to Hume within a philosophy that is wholly or mainly empirical. If not, there is no intellectual difference between sanity and insanity. The lunatic who believes that he is a poached egg is to be condemned solely on the ground that he is in a minority ... OK p. 5.

In reaction to this, Popper states that "... no such irrationalist conclusion can be derived from my solution of the problem of induction."  

Section 2

The purpose of this section will be to outline Popper's solution to what seems to be, from Hume's and Russell's points of view, the inescapable irrationality of human knowledge. His methodology is as follows. First, he reformulates the logical problem of induction (H_L) and solves it. Second, he reformulates the psychological problem of induction (H_ps) and, using what he calls the 'principle of transference,' solves it. This explication will deal only with Popper's solution to what he formulates as the logical problem of induction. It is within the scope of this solu-
tion that Popper has many interesting statements to make about man's rationality, both from a theoretical and practical point of view.

Popper's reformulations of the logical problem of induction amount to, first, a reformulation of Hume's problem into the objective mode, and, second, a generalization of Hume's problem in the objective mode. Popper's reformulation is as follows:

$L_1$ Can the claim that an explanatory universal theory is true be justified by "empirical reasons"; that is, by assuming the truth of certain test statements or observation statements (which, it may be said, are "based on experience")? OK, p. 7.

Popper, in agreement with Hume, answers this question in the negative: "... no number of true test statements would justify the claim."\footnote{9}

Popper's generalization of $L_1$ is as follows:

$L_2$ Can the claim that an explanatory universal theory is true or that it is false be justified by "empirical reasons"; that is, can the assumption of the truth of test statements justify either the claim that a universal theory is true or the claim that it is false? OK, p. 7.

Popper's answer to this question is: Yes. He states:

\begin{quote}
... the assumption of the truth of test statements sometimes allows us to justify the claim that an explanatory universal theory is false. OK, p. 7.
\end{quote}

The above quote embodies Popper's solution to the problem of induction. It revolves around the concept of justification. It would seem that the following illustration; simple as it may be, captures the main thrust of
Popper's thinking. The empirical statement "All men are tall" cannot be verified by any amount of empirical observation. As Popper has stated, "no number of true test statements would justify the claim." This, of course, follows from Hume's negative answer to $H_L$ and Popper's negative answer to $L_1$. Although, with respect to Popper's positive answer to $L_2$, we can empirically establish the falsity of the statement. That is, by observing one short man. The falsity of the first statement is entailed by the observation of one counter-instance. Hence, it can be seen that Popper's solution to the problem of induction amounts not to a valid inductive principle, but to a deductive model of empirical falsification by which we may be justified in making a judgement about the world, even if it is a negative one.

Given this solution, Popper concentrates on the problem of man's rationality. As well as formulating a generalization of $L_1$, i.e., $L_2$, he offers an alternative form of the generalization, $L_3$:

$L_3$ Can a preference, with respect to truth or falsity, for some competing universal theories over others ever be justified by such "empirical reasons"? OK, p. 8.

Popper answers in the following manner:

Yes, sometimes it can, if we are lucky. For it may happen that our test statements may refute some — but not all — of the competing theories; and since we are searching for a true theory, we shall prefer those whose falsity has not been established. OK, p. 8.
It would seem that the positive answer Popper gives to \( L_3 \) amounts to the following: Given two or more competing theories, we can be justified in our preference for one of those theories on the basis of the other(s) being refuted. Once this is realized, Popper states that ". . . we are led . . . to the rudiments of a critical methodology."\(^{11}\)

Now that it has been seen that Popper chooses to see the underlying problem of the traditional philosophical problem of induction - i.e., man's rationality or his ability to justify claims that he makes about the world - in terms of preference, what remains to be explained is the method a rational man utilizes. By following the rudiments of what Popper calls a "critical methodology" or by engaging in what Popper terms "critical discussion" one lives a rational life. By way of introduction and example, Popper states:

I do not know of anything more "rational" than a well conducted critical discussion. \( OK, \) p. 22.

. . . there is nothing more "rational" than the method of critical discussion, which is the method of science . . . there is nothing "better" when it comes to practical action. \( OK, \) p. 27.

The following is an elucidation of Popper's critical methodology. According to Popper, because of his negative answer to \( L_1 \), all universal theories must be seen as guesses, conjectures or hypotheses.\(^{12}\) Hence, it is a
matter of preferring one guess to another (or one guess over a number of other guesses). The question, then, becomes:

... can [there] be purely rational arguments, including empirical arguments, for preferring some guesses or hypotheses to others? OK, p. 13.

To answer this question Popper sub-divides preference into two classes: theoretical preference and pragmatic preference. As far as theoretical preference is concerned, it is a matter of formulating "principles of preference."

Examples of some of these principles of preference would be the following:

The theoretician will for several reasons be interested in non-refuted theories, especially because some of them may be true. He will prefer a non-refuted theory to a refuted one, provided it explains the successes and the failures of the refuted theory. OK, p. 14.

The theoretician will try his best to detect any false theory among the set of non-refuted competitors; he will try to "catch" it ... he will try to conduct severe tests, and crucial test situations. OK, p. 14.

... it is assumed that a good theory is not ad hoc ... Ad hoc explanations are explanations which are not independently testable ... and are of little theoretical interest. OK, p. 15.

Of these and other principles, Popper states:

The method described may be called the critical method. It is a method of trial and the elimination of errors, of proposing theories and submitting them to the severest tests we can design. If, because of some limiting assumptions, only a finite number of competing theories are regarded as possible, this method may lead us to the true by eliminating all its competitors. OK, p. 16.

For the theoretician, then, principles of preference
embody his method. These methodological rules, Popper states, are "... the rules of critical discussion." When the theoretician is engaged in critical discussion, he sees truth as a regulative idea. In Popper's own words:

*We test for truth, by eliminating falsehood.* OK, p. 30

... these rules may be regarded as subject to the general aim of rational discussion, which is to get nearer to the truth. OK, p. 17.

For Popper, pragmatic preference is closely connected to theoretical preference but it is seen in different terms. The man of practical action is faced not with a set of competing theories, at least not per se, but with a preference towards two or more courses of action. He must answer the question: "Which course of action should I choose?" Popper says that each competing course of action will presuppose a theory. Hence, Popper formulates the pragmatic problem of induction in the following manner:

Pr₁. Upon which theory should we rely for practical action, from a rational point of view? OK, p. 21.

Pr₂. Which theory should we prefer for practical action, from a rational point of view? OK, p. 21.

Popper's answer to Pr₁ (which corresponds to Hₐ and L₁) is: none. This is because no theory can be shown to be true (this corresponds to the negative answers to both Hₐ and L₁). In answer to Pr₂, Popper states that we should prefer the best-tested theory, according to the rules of a critical methodology. Popper elaborates:
... in spite of the "rationality" of choosing the best-tested theory as a basis of action, this choice is not "rational" in the sense that it is based upon good reasons for expecting that it will in practice be a successful choice: there can be no good reasons in this sense, and this is precisely Hume's result. OK, p. 22.

Popper explains in the following quote where "rationality" comes in:

In other words, there is no "absolute reliance"; but since we have to choose, it will be "rational" in the most obvious sense of the word known to me: the best-tested theory is the one which, in the light of our critical discussion, appears to be the best so far, and I do not know of anything more rational than a well conducted critical discussion. OK, p. 22.

To summarize, it is irrational to rely in any absolute sense on any theory for no theory can be shown to be true - successful. It is rational to choose (or prefer) a course of action, if one can be singled out that has not yet been shown to be unsuccessful - false.

Section 3

The purpose of this section is to draw a clear and concise picture of Karl Popper's prescription for "rationality." It would seem that at least the following two statements can be made, reflecting Popper's thought on rationality. Each statement that is formulated will be preceded by words of explanation or by words of general introduction.

First, Popper's idea of rationality grows out of his considerations on what he has called Hume's problem. That is, it is logically impossible to justify an inductive claim.
For the theoretician, it means this: There is no way his laws can be shown or demonstrated to be true. Induction can constitute no method for the theoretician. For the pragmatist, or the man of action, it means this: There can be no good reasons for any type of action. All action, by implication, is irrational. Hence, it would seem that the following statement can be formulated:

\[ P_1 \] An appeal to the past (from a theoretical point of view), or reliance on the past (from a pragmatic point of view), for verification of theories or for conduct in the future, does not constitute rational conduct on the part of man.

It may be noted here that the above formulation follows from Hume’s negative answer to \[ H_L \] in addition to Popper’s negative answers to \[ L_1 \] and \[ Pr_1 \]. Popper’s positive answers to \[ L_2 \], \[ L_3 \] and \[ Pr_2 \] give rise to what does constitute rationality on the part of man. There are at least three distinct concepts to note if one is to formulate what is rational for Popper: 1) justification; 2) preference; 3) method. The concept of justification is found in \[ L_2 \]. The concept of preference is found in \[ L_3 \]. The concept of method arises out of the solution to the traditional philosophical problem of induction, \[ L_2 \] and \[ L_3 \]. Popper’s solution, it is important to note, is based on the deductive model of inference. He states:

My formulations and my solutions of \[ L_1 \], \[ L_2 \], and \[ L_3 \] fall entirely within the scope of deductive logic. OK, p. 12.
It is also important to note, as Popper states,
"... if we wish to apply pure logic to any lifelike situation ... it leads to what I have called methodological rules, the rules of critical discussion." It would seem, then, that the following statement can be formulated.

P₂ A rational man is one who is guided by the methodological rules of critical discussion to justify his preference for a theory or a course of action --this means that methodological principles determine his application of pure logic to lifelike situations.
FOOTNOTES

Chapter I


2 Ibid., p. 4.

3 Karl Popper, *Logic of Scientific Discovery*, p. 34.

4 Ibid., p. 33.

5 Popper, *Objective Knowledge*, p. 5.

6 Ibid., p. 5.

7 See *Objective Knowledge*, p. 6, "principle of transference:" "... what is true in logic is true in psychology."

8 Ibid., pp. 7-9.

9 Ibid., p. 7.

10 See *Objective Knowledge*, p. 7, and pp. 13-14. Popper holds that the "problem situation" in which the problem of induction arises is when there is a set of competing explanations for the same problem.

11 Ibid., p. 12.

12 Ibid., p. 13.

13 Ibid., p. 17.

14 Ibid., p. 21.

15 Ibid., p. 22.

16 Ibid., p. 17.
CHAPTER II

WITTGENSTEIN ON THE CONCEPT OF JUSTIFICATION

P1 An appeal to the past (from a theoretical point of view), or, reliance on the past (from a pragmatic point of view), for verification of theories or for conduct in the future, does not constitute rational conduct on the part of man.

Introduction

If one of Karl Popper's students confronted Wittgenstein and told him he had learned or had become convinced that reliance on the past for conduct in the future trapped man in a sea of irrationality, Wittgenstein might reply: "If anyone said that information about the past could not convince him that something would happen in the future, I should not understand him."1 He might also reply: "Justification by experience comes to an end. If it did not it would not be justification."2

The purpose of this chapter is to outline arguments that Wittgenstein could use to meet the student's confrontation. The chapter will consist of two main sections. The first section will attempt to demonstrate that the request for justification of inductive inferences has no sense, or meaning. The second section will attempt to demonstrate how the language-game of justification precludes such a
I. The request for justification of inductive inferences has no sense.

Wittgenstein, then, might initially reply to the student's confrontation by telling him that he does not understand why past information could not convince him of something happening in the future. He could go on in the following manner:

What do you expect to be told, then? What sort of information do you call a ground for such a belief? What do you call 'conviction'? In what kind of way do you expect to be convinced? - If these are not grounds, then what are grounds? - If you say these are not grounds, then you must surely be able to state what must be the case for us to have the right to say that there are grounds for our assumption. PI #481.

With this response, Wittgenstein has added something to his initial reaction. That is, Wittgenstein has not only told the student that he does not understand the student's conviction, but he has also given the student a hint as to why he is perplexed. Wittgenstein has asked the student for his grounds, or reasons, for saying that a person would be irrational to depend on the past for conduct in the future. Wittgenstein wants the student to enlarge upon or fill out his reasoning on the matter. He has made his request by reference to "grounds." Why is it, he asks, that we need grounds, or by what "right" can grounds be demanded for our assumption that the past can convince one of something happening in the future? Wittgenstein, in order to explain
further, could then go on to outline to the student what he understands by "grounds." He writes:

The question: "On what grounds do you believe this?" might mean: "From what are you now deducing it (have you just decided it)?" But it might also mean: "What grounds can you produce for this assumption on thinking it over?" PM, #479.

Giving a reason for something one did or said means showing a way which leads to this action. In some cases it means telling the way which one has gone oneself; in others it means describing a way which leads there and is in accordance with certain accepted rules. EB, p. 14.

That is, when one normally asks for grounds, or justification, one might be asking for calculations, reasons, logical inferences, etc. for an opinion or an action. For example, imagine a carpenter, who is in the process of building a new home, being questioned by the man who will someday move into the house. The carpenter has placed a supporting beam in a certain position on top of the foundation wall. His employer, being concerned about the structural strength of his new home, questions the carpenter as to the particular positioning of the beam. The carpenter might reply that he has taken a close look at the architect's plans for the completed house, calculated stress factors, etc. in accordance with these plans, and deduced from this the exact positioning of the supporting beam. The carpenter has been asked, in Wittgenstein's words, "From what are you now deducing it?" The new home-owner, understandably concemed about the particular positioning of the beam might
then ask the carpenter just exactly how he arrived at his decision. The carpenter could then show how he made his calculations, he may even re-check them in the owner's presence. The carpenter, according to Wittgenstein, has shown a way which leads to his action in "accordance with [the] accepted rules" of calculation.

The preceding is an illustration or use of the question: "What are your grounds for this opinion or action?"

Wittgenstein states:

Thus one could in fact take "grounds" for an opinion to mean only what a man had said to himself before he had arrived at the opinion. The calculation that he had actually carried out. PI, #480.

The questions that were asked of the carpenter, then, Wittgenstein could tell Popper's student, were perfectly good, sensible, meaningful questions.

In what sense does Wittgenstein want to say that a question is a meaningful one? Wittgenstein wants to point out that meaningful questions are asked under a particular set of circumstances. For example, each time the owner of the house asked the carpenter to give grounds for his actions, the following aspects of the scenario can be noted. First, the carpenter has recourse to some type of action; that is, he is perfectly capable of answering his employer's questions (he can show calculations that he has actually carried out). Second, if the carpenter for some reason does not understand the questions, or does not un-
derstand why he is being asked the questions, the employer has recourse to some type of action; that is, he is perfectly capable of explaining his questions. He can fill out his demands for grounds or justification (if the carpenter does not understand what type of question he is being asked, the owner can show him what type of calculations he is looking for, or, if the carpenter wonders why the questions are being asked the owner can tell him that his former home collapsed, etc. . . .).

After Wittgenstein had explained to the student of Popper what he thought was a meaningful question about grounds, he could go on to explain how one comes to ask a question about grounds that has no sense. Wittgenstein writes:

We are misled by this way of putting it: "This is a good ground, for it makes the occurrence of the event probable." That is as if we had asserted something further* about the ground, which justified it as a ground; whereas to say that this ground makes the occurrence probable is to say nothing except that this ground comes up to a particular standard of good grounds - but the standard has no grounds!" PI, #482.

What is it to ask something "further" about grounds as a result of being "misled"? For instance, how would such a [philosophical] phenomenon come about between the carpenter and the home owner?

Consider the following. Imagine that the home-owner left one day, satisfied with the carpenter's explanations,

*Emphasis mine. "*" will denote any further emphases added.
and, suddenly returned the next, suffering from what might be called an abnormally intense degree of doubt. He has come back with the desire for further explanation or greater demands for justification. He might address the carpenter in the following manner: "You have told me that you made certain calculations. You have also told me that you made these same calculations, or calculations like these, innumerable times in the past. These calculations, you tell me, have always been successful. I grant you this. But, how can you be certain that they will be successful now, or in the future? For that matter, how can you be certain that calculating, period, always brings success?"

The home-owner, then, had previously asked the carpenter what he, in Wittgenstein's words, "had said to himself before he arrived at the opinion. The calculation that he had actually carried out." But now the home-owner has asked a question of a different type. Wittgenstein refers to this type of question in the following. He writes:

"It if is now asked: But how can previous experience be a ground for assuming that such-and-such will occur later on? - the answer is: What general concept have we of grounds for this kind of assumption? This sort of statement about the past is simply what we call a ground for assuming that this will happen in the future. - And if you are surprised at our playing such a game I refer you to the effect of a past experience (to the fact that a burnt child fears the fire). PI, #480."

What can Wittgenstein now show the student of Popper to illustrate his "answer"? That is, to show both how the
student comes to ask the question he does, in addition to the manner in which past experience acts as a ground for future occurrences.

Wittgenstein could point out to the student that to ask something "further about the ground" is a result of following too far the line of thought that states "this is a good ground for it makes the occurrence of the event probably." When this is done, one becomes misled into thinking every belief or action must have grounds. Following this line of thought to the limit makes one think that all our grounds must be justified. In the case of the carpenter: he uses mathematical calculations as a ground, or standard, or as a justification when asked for his particular actions. Do these grounds in turn need justification? Wittgenstein comments on this type of reasoning or thinking in the following manner: "...[the] idea of an infinite chain of reasons arises out of a confusion similar to this: that a line of a certain length consists of an infinite number of parts because it is indefinitely divisible; i.e., because there is no end to the possibility of dividing it..." For Wittgenstein, this type of reasoning needs to be given up. He states:

The reasoning that leads to an infinite regress is to be given up not 'because in this way we can never reach the goal,' but because there is no goal;* so it makes no sense to say 'we can never reach it.' 7, #693.

The standard, Wittgenstein has stated, "has no grounds!"
Hence, Wittgenstein has shown the student of Popper how one comes to ask a question about grounds that has no sense. That is, one follows a misleading line of thought searching for a goal that, Wittgenstein tells us, does not exist.

What Wittgenstein needs to show the student, though, is how statements about the past act as a ground for future occurrences or how it is that we "simply call [them] a ground for assuming that this will happen in the future." What is at the root of the student's confrontation is the following. When the student questions the belief that—it is probable for something to happen in the future because of some past occurrence, he questions by implication a principle like "the future will be like the past" or the principle of the uniformity of nature. It is precisely this implication that the student of Popper thinks needs justification. That is, if the principle of the uniformity of nature cannot be justified, then inductive inferences cannot be judged as rational. That is, our dependence on the principle of the uniformity of nature is senseless. This justification, the student properly notes, cannot come from experience. Hence, there is no possibility, following this particular line of reasoning, of an a posteriori justification.

What the student is questioning, in Wittgenstein's
words, is this: "But isn't it experience that teaches us
to judge like this, that it is correct to judge like
this?" In reply to this question, Wittgenstein wants to
show the student that not only is his particular line of
reasoning confused, but that experience does not "teach"
us the principle of the uniformity of nature. Once this
is realized, it can then be seen how it is senseless to
ask experience to explain or justify the phenomenon of
our dependence on that principle. Wittgenstein states:

But how does experience teach us, then? We may derive
it from experience, but experience does not direct us
to derive anything from experience. If it is the
ground for our judging like this ... still we do not
have a ground for seeing this in turn as a ground.
OC, §130.

That is, the principle of uniformity of nature is not
something that we learn from experience or it is not a
principle that experience teaches us. Although Wittgenstein
states "we may derive it from experience" it is a mistake to
expect experience to tell us "it is correct to judge like
this." To say that experience does not "teach" us our be-

lief in the uniformity of nature is to say that it cannot
explain it. It cannot give us a final answer to the
question: "From what are you now deducing it?" This in
turn is to say that it cannot give us a ground for our de-
pendence. Wittgenstein states:

We readily think that we must run through a few steps
of the regress and then so to speak give it up in de-
spair. Whereas its aimlessness (the lack of a goal in
the calculus) can be derived from the starting position. Z, #693.

The aimlessness can be recognized from "the starting position" by recognizing the character and status of what is called the principle of the uniformity of nature. Concerning its character, Wittgenstein states:

The character of the belief in the uniformity of nature can perhaps be seen most clearly in the case in which we fear what we expect. Nothing could induce me to put my hand into a flame - although after all it is only in the past that I have burnt myself. PI, #472.

The belief that fire will burn me is of the same kind as the fear that it will burn me. PI, #473.

What is to be made of the comparisons that Wittgenstein makes? He compares the belief in the uniformity of nature with the belief that fire will burn me if I come into contact with it. He then compares the belief that fire will burn me with the fear of fire. Wittgenstein has stated earlier that a child's fear of fire is an effect of past experience. To say that it is an effect of past experience is to say that it is caused by past experience. For example, Wittgenstein asks:

'The certainty that fire will burn me is based on induction.' Does that mean that I argue to myself: 'Fire has always burned me, so it will happen now too?' Or is the previous experience the cause of my certainty, not its ground." PI, #325.

... previous experience may well be the cause of my present certitude; but is it its ground? OC, #429.

By asking these questions, Wittgenstein wants the
following point to hit home. The fear of fire, the belief that fire will burn, and the belief in the uniformity of nature share the same essential characteristic: they are all a result of something other than reasoning. The belief in the uniformity of nature is a belief that we do not normally give reasons for. Wittgenstein writes:

Under ordinary circumstances I do not satisfy myself that I have two hands by seeing how it looks. Why not? Has experience shown it to be unnecessary? Or (again): Have we in some way learnt a universal law of induction, and do we trust it here too? But why should we have learnt one universal law first, and not the special one straight away? OC, #133.

Is it that we trust the certainty of our belief in the uniformity of nature so that we may trust the certainty of the belief that we have two hands? Can we be more certain of previous experience than we are that we have two hands? Wittgenstein answers:

My having two hands is, in normal circumstances, as certain as anything that I could produce in evidence for it. OC, #250.

We do not, then, normally give reasons for our belief in the uniformity of nature. This is evidenced by the fact that we do not normally give reasons for such beliefs as the belief that fire will burn, or the belief that we have two feet or two hands. As it will be noted later, we just simply act this way in our lives. Our belief that fire will burn is evidenced by the fact that we naturally stay clear of it. Wittgenstein states:
But do we not simply follow the principle that what has always happened will happen again (or something like it)? What does it mean to follow this principle? Do we really introduce it into our reasoning? Or is it merely the natural law which our inferring apparently follows? This latter it may be. It is not an item in our considerations.* OC, #135.

We do not "normally" give reasons for our belief that fire burns or our belief in the uniformity of nature. Are these beliefs the type of beliefs that we can give reasons for? For example, what would it be like to give reasons for the belief that fire will burn me? This would be like giving reasons for the fear that fire will burn me. Wittgenstein does not think it makes sense to give reasons for this type of belief. He writes:

'Why would you believe that you will burn yourself on the hot-plate?' -- Have you reasons for this belief; and do you need reasons? PI, #477.

What kind of reason have I to assume that my finger will feel a resistance when it touches the table? What kind of reason to believe that it will hurt if this pencil pierces my hand? -- when I ask this, a hundred reasons present themselves, each drowning the voice of the others. 'But I have experienced it myself innumerable times, and as often heard of similar experiences; if it were not so, it would ...; etc.' PI, #478.

According to Wittgenstein, then, just as it would be hard to imagine how one could give reasons for the fear of fire, it would be hard to imagine how a carpenter could give reasons for his faith in calculating - his faith, for example, that 2+2=4 every time the calculus is performed. When the carpenter is asked to show grounds or justification that his calculations work all of the time, he is being asked, as
Wittgenstein has told us, "how can previous experience be a ground for assuming that such-and-such will occur later on?" The carpenter could attempt to give reasons, but would they, properly speaking, be reasons? It would not seem so. That is to say, the carpenter's explanations would not result in any real difference in the building of the house. If, for instance, the carpenter told the home-owner that he had done calculating "innumerable times in the past," or that he had heard of other carpenters having innumerable successes with calculating, the home-owner would find himself in a position in which there is no possible course of action open to him. After he has heard the carpenter's "grounds," what possible line of questioning can he pursue, unless he asks the same question once again? The question which takes the form: 'How do you know it will happen in the future because it has done so in the past?'. Wittgenstein states:

On being asked for the grounds of a supposition, one be thinks oneself of them. PI, #475.

This can perhaps be seen as a purely logical point. That is, whereas the home-owner has no choice but to be redundant, the carpenter has no choice but to "beg the question." The carpenter's explanation, or his "premise," is "... such that we could not accept it unless we had already accepted the conclusion." Wittgenstein states that we "... expect this, and are surprised at that."
But the chain of reasons has an end.\textsuperscript{11}

Thus, the belief that fire burns, or the carpenter's belief that his calculations work or that they are dependable are beliefs that Wittgenstein characterizes as beliefs that are not reasoned to. Nor are they beliefs of which it makes sense to give reasons for. Finally, these beliefs are evidenced by the fact that we act in certain ways. For the carpenter, calculation is treated as reliable, as certain. Wittgenstein writes:

\textit{This is how calculation is done, in such circumstances a calculation is treated as absolutely reliable, as certainly correct. \textsc{oc}, \#39.}

I want to say; it's not that on some points men know the truth with perfect certainty. \textit{No: perfect certainty is only a matter of their attitude.} \textsc{oc}, \#404.

According to Wittgenstein, then, the carpenter adopts an attitude that allows him to practice his trade. He adopts a particular attitude about calculation. He is absolutely certain that it works. For example, the carpenter naturally assumes when he makes a calculation and places a beam in a certain position that the beam will perform its function. The calculations, surely enough, may not work - i.e., it may turn out that the beam's position will have to be altered - but the carpenter treats this as an exception.\textsuperscript{12} That is, he does not doubt the value of calculating. What he does do is find out why his particular calculations do not work in this particular situation. He assumes the norm
- that calculation works - and explains the exception - why it has not worked in this particular situation.

Wittgenstein states:

Just as in writing we learn a particular basic form of letters and then vary it later, so we learn first, the stability of things as the norm, which is then subject to alterations.* OC, #473.

In particular circumstances one says 'you can rely on this'; and this assurance may be justified or unjustified in everyday language, and it may also count as justified even when what was foretold does not occur.* A language-game exists in which this assurance is employed. OC, #260.

It is precisely in this way that the carpenter can be said to believe in the uniformity of nature: he acts in such a way as to rely or depend on it, and trust in it. If he did not trust calculating, he could not explain abnormalities or he could not justify his actions or opinions. In short, he could not carry on a host of language-games. Wittgenstein writes:

Must I not begin to trust somewhere? That is to say: somewhere I must begin with not-doubting; and that is not, so to speak, hasty but excusable: it is part of judging.* OC, #509.

I really want to say that a language-game is only possible if one trusts something. OC, #150.

An assent to the belief that nature is uniform, then, is "part of judging." By trusting, for example, that calculating will work in the future because it has done so in the past, we characterize the very nature of judgment.13 That is, our judgments can then take the form of what we
understand as explanations or justifications. Only when we trust a principle as the norm can we make sense of the world around us.

It was noted earlier that the "aimlessness" of the search for justification by experience can be stopped at the "starting position" by recognizing both the character and status of our belief that nature is uniform. It has been argued that the character of this belief can be seen as essentially one of an attitude. That is, an attitude which is not reasoned to, nor one that reasons can be given for. If this attitude is not a proposition to be proved, in order that our actions might be justified, just what is its status in our lives? What is its function in our everyday activities such as investigating, explaining, justifying, etc.; - its function in our language-games?

Wittgenstein gives us a hint as to the status of the belief in the uniformity of nature when he refers to our right to assume it. He has asked: "But how can previous experience be a ground for assuming that such-and-such will occur later on?". With this hint in mind - i.e., that our belief in the uniformity of nature is one that we assume - its role, or status, can be described as a foundation. That is, its status is that of a foundation in our language-games of investigating, explaining, justifying, etc. Wittgenstein states:
We say we know that water boils and does not freeze under such-and-such circumstances. Is it conceivable that we are wrong? Wouldn't a mistake topple all judgment with it? More: what could stand if that were to fall? Might someone discover something that made us say 'It was a mistake'?

Whatever may happen in the future, however water may behave in the future, -- we know that up to now it has behaved thus in innumerable instances.

This fact is fused into the foundations of our language-game.* OC, #558.

If I say 'we assume that the earth has existed for many years past' (or something similar), then of course it sounds strange that we should assume such a thing. But in the entire system of our language-games it belongs to the foundations.* The assumption, one might say, forms the basis of action, and therefore, naturally, of thought. OC, #411.

The attitude that nature is uniform is a conviction we have ". . . that is [so] anchored in my questions and answers . . . that I cannot touch it." That is to say, rather than being a proposition that calls for evidence it is ". . . the matter-of-course foundation* for . . . research and as such . . . goes unmentioned.* Wittgenstein states:

That is to say, the questions that we raise and our doubts depend on the fact that some propositions are exempt from doubt, are as it were like hinges on which those turn. OC, #341.

If I want the door to turn, the hinges must stay put. OC, #343.

Hence, to take the attitude that nature is uniform we give it its status in the foundations of our language-games. We exempt it from doubt. Wittgenstein writes:

That is to say, it belongs to the logic of our scientific investigations that certain things are in deed not doubted. OC, #342.
My life consists in my being content to accept many things. OC, #344.

We have seen, then, that if Wittgenstein were confronted by a student of Karl Popper and told there were no grounds for the belief that information about the past will guarantee something happening in the future, Wittgenstein could answer the student by pointing out the meaninglessness of the question. He could accomplish this by asking the student for his reasons or grounds for the belief that the past does not assure us of something happening in the future. We have also seen that once Wittgenstein had convinced the student his assertion carried no sense, Wittgenstein could go on to show the student how the futility of searching for the ground or justification of inductive inferences could be realized. In order to accomplish this, Wittgenstein could describe the character and status of "the principle of uniformity of nature." In describing the character and status of the belief in the uniformity of nature, Wittgenstein would be attempting to point out to the student that the "... difficulty is to realize the groundlessness* of our believing,"17 or, that at "... the foundation of a well founded belief lies belief that is not founded."*18

It was stated in the introduction that the language-game of justification precludes the kind of request the student of Popper makes. The remainder of this chapter
will consist in noting Wittgenstein's observations on
the concept of justification. The point of the following
section will be to show that the language-game of justi-
fication, properly understood, precludes any request for
the justification of inductive inferences.

2. **The language-game of justification precludes the
request for justification of inductive inferences**

In the *Philosophical Investigations*, Wittgenstein
urges us to note the use of the word 'justification' to
become aware of its import. He writes:

> Describe language-games. From these you will be able to see the importance of being justified. PI, #486.

If we were to describe the manner in which we use
the word 'justification' in our everyday language, the
following aspects of this use might be observed. We
might find that the concept of justification is part of
a game that is learned; taught to us like any other con-
cept we use. The game could be described as one in which
we ask questions, expect answers, and ask for justifica-
tion for those answers. It might also be described as a
game in which we make statements, expect disagreement with
those statements, and offer justification for those state-
ments. However it is played, Wittgenstein wants it to be
realized that the game has certain rules or conventions
that assure the successful playing of the game. For
example, the language-game of justification has an end.
There is a point at which it is inappropriate to ask for or give justification. Imagine, Wittgenstein asks us, a student demanding to know if a table disappears when it is out of sight. Wittgenstein tells us that the teacher may "... get a bit impatient, but think that the boy will grow out of asking such questions." He goes on:

That is to say, the teacher will feel that this is not really a legitimate question at all.

And it would be just the same if the pupil cast doubt on the uniformity of nature, that is to say on the justification of inductive arguments. The teacher would feel that this was only holding them up, that this way the pupil would only get stuck and make no progress. And he would be right. It would be as if someone were looking for some object in a room; he opens a drawer and doesn't see it there; then he closes it again, waits, and opens it once more to see if perhaps it isn't there now, and keeps on like that. He has not learned to look for things. And in the same way this pupil has not learned how to ask questions. He has not learned the game that we are trying to teach him. *OC, #315.

Hence, the game of asking questions or the game of asking for justification is one that can be said to be played legitimately or, by implication, illegitimately. In light of this, there are three questions that the remainder of this section must answer: a) When can it be said that it is legitimate to ask for justification? b) When can it be said that it is illegitimate to ask for justification? and c) How does this understanding of the language-game of justification preclude the demand for the justification of inductive inferences? Questions a) and b) will be answered together and the answer to
question c) will conclude the section.

To gain an understanding of when it is appropriate or inappropriate to ask for justification, consider the following passages from the *Philosophical Investigations.*

Wittgenstein writes:

Disputes do not break out (among mathematicians; say) over the question whether a rule has been obeyed or not. People do not come to blows over it, for example. This is part of the *framework* on which the working of our language is based. *PI,* #240.

'So you are saying that human agreement decides what is true and what is false?' -- It is what human beings say that is true and false; and they agree in the language they use. That is not agreement in opinions but in form of life.* *PI,* #241.

Whether or not a rule has been obeyed, Wittgenstein notes, is not customarily cause for argument. For example, when people practice mathematics with some concrete purpose in mind they do not, according to Wittgenstein, question the particular grammar or the particular calculus they use to solve that problem. They are not, Wittgenstein cautions us, arbitrarily setting up truth and falsity. Their agreement, he tells us, is not "agreement in opinions." Knowledge, he states elsewhere, is objectively established. Whether or not something is true or false has to be demonstrated. Wittgenstein states:

'I know' often means: I have the proper grounds for my statement. So if the other person is acquainted with the language-game, he would admit that I know. The other, if he is acquainted with the language-game, must be able to imagine *how* one may know something of the kind. *OC,* #18.
Wittgenstein wants to point out that the mathematician, in putting forth certain opinions, has learned a game in which calculations are used to justify those opinions. Other mathematicians have learned this game also, and they are familiar with the different uses of calculation to justify opinions. They can imagine "how one may know." But Wittgenstein also wants to point this out: "To be sure there is justification; but justification comes to an end." 21 He states:

In certain circumstances, for example, we regard a calculation as sufficiently checked. What gives us a right to do so? Experience? May that not have deceived us? Somewhere we must be finished with justification, and then there remains the proposition that this is how we calculate. OC, #212.

If I have exhausted the justifications I have reached bedrock, and my spade is turned. Then I am inclined to say: 'This is simply what I do.' PT, #217.

Wittgenstein points out, then, that once the game of justification comes to an end we have reached what he has referred to as the "framework" of our language-games. Once we are in this position, it would be hard to imagine how, for instance, any disagreement could take form over the proposition "2+2=4". Wittgenstein states:

Well, if everything speaks for an hypothesis and nothing against it - is it then certainly true? One may designate it as such. - But does it agree with reality, with the facts? - With this question you are already going round in a circle." OC, #191.

We are 'going round in a circle' because to ask a question about reality, or the facts, presupposes (is logically
prior to something that we can all agree upon. For example, a shared form of life, or a common attitude about reality. The mathematician shares an agreement with his fellow mathematicians on the use of symbols or signs like "+", ",=" , or ", -". This, in turn, enables them to understand their justifications. Hence, to attempt to justify the manner in which we act is akin to the dog chasing its own tail. Wittgenstein states:

...the end is not an ungrounded presupposition: it is an ungrounded way of acting.* OC, #110.

Giving grounds...justifying the evidence, comes to an end; - but the end if not certain propositions striking us immediately as true, i.e., it is not a kind of seeing on our part; it is our acting, which lies at the bottom of the language-game. OC, #204.

To conclude, this shared form of acting or shared form of life can be seen as training that we receive when we learn, for instance, the game of asking questions and giving answers. Wittgenstein has told us we agree in the language we use. It is not that we can agree, or justify the language we use, but that we just simply do it. We calculate like this, we calculate like that. As he states: "A good ground is one that looks like this."23 We learn, that is, the language-game of justification only after we accept a great deal "...on human authority...and then [find]...some things confirmed or disconfirmed by...experience."24 The language-game of justification, then, precludes the demand for justification of inductive in-
ferences, for if we did not accept the principle of the uniformity of nature we could not go about justifying anything. The principle of the uniformity of nature then, is logically prior to justification, or justification presupposes the principle of the uniformity of nature. As Wittgenstein states: "Justification by experience comes to an end. If it did not it would not be justification." 25

Hence, Wittgenstein, in light of the preceding, could advise the student of Popper in the following manner. He states:

The danger here, I believe, is one of giving a justification of our procedure where there is no such thing as a justification and we ought simply to have said: that's how we do it. RHM II, #74.

Summary

This chapter has dealt with the issue of the justification of inductive inferences. The issue is important, as Popper has pointed out, because what is at stake is a good explanation or justification of human rationality. In regard to this issue, the relevant points that have surfaced in the preceding are as follows.

Both philosophers note the infinite regress that one finds oneself in when the attempt is made for the justification of inductive inferences. That is, Wittgenstein and Popper agree that inductive inferences cannot be logically justified.
The disagreement between Popper and Wittgenstein, though, is of a much less straightforward nature. That is, Wittgenstein is not interested in refuting Popper's stand on the issue, at least not in a direct manner. Wittgenstein, rather, is interested in questioning Popper on his understanding of the issue. He wants not to prove Popper wrong but to show Popper that his demand for justification is not the type of demand one sensibly makes. Hence, Wittgenstein questions the value of Popper's demand.

What, then, is it about Popper's approach to the traditional philosophical problem of induction that is troublesome from Wittgenstein's point of view? To be more precise, why must the value of Popper's demand for the justification of inductive inferences be questioned? Perhaps what follows will answer these questions. Popper has taken a belief that we all share, and transformed it into a hypothesis. That is, he asks for evidence to prove that nature is uniform. He wants to know, simply put, if this belief accurately reflects the way things really are. Wittgenstein wants to show Popper that his demand has a strange twist to it. That is, reality, as we know it (as we understand it) is known (understood) with the adoption of the attitude expressed: "nature is uniform." Wittgenstein's point is that the proposition 'nature is uniform' is not, properly taken, a proposition about the way things really are but rather a proposition
that expresses a belief or an attitude we use to understand the way things really are. The latter is the expression's use. Popper questions our attitude, though, not as an attitude but as a hypothesis. He thereby transforms our belief into a proposition that has no use. That is, as a hypothesis, the proposition 'nature is uniform' has no meaning. Hence Wittgenstein questions the value of demanding justification for what might be called a "pseudo-hypothesis."
FOOTNOTES

Chapter II


2 Ibid., #485.

3 Altered translation, i.e., "you are" to "are you".


7 Wittgenstein, OC, #130.

8 Ibid., #429.

9 Ibid., "s 120, 338.

10 Wittgenstein, LSP, p. 183.

11 Wittgenstein, PI, #326.

12 Wittgenstein, OC, #34.

13 Ibid., "s 124, 149.

14 Wittgenstein, PI, #478.

15 Ibid., #480.

16 Wittgenstein, OC, #103.

17 Ibid., #166.

18 Ibid., #253.

19 Ibid., #314.

20 Ibid., "s 15, 16.
Chapter II

21. Ibid., #192.
22. Ibid., #509.
CHAPTER III

WITTGENSTEIN ON THE CONCEPT OF RULE

$P_2$ A rational man is one who is guided by the methodological rules of critical discussion to justify his preference for a theory or a course of action—this means that methodological principles determine his application of pure logic to lifelike situations.

Introduction

For the purpose of accurately reflecting Karl Popper's views on the concept of rationality, two statements were formulated in the first chapter of this paper. The first statement, $P_1$, can be described as a negative statement, in that it is meant to reflect what Popper thinks is not rational. The second statement, $P_2$, can be described as a positive statement, in that it is meant to reflect what Popper thinks is rational. I will argue in this chapter that what Popper thinks is rational is, upon reflection, a view that is not sufficient, from a Wittgensteinian point of view.

What is central to Popper's version of rationality, $P_2$, is an appeal to principles or rules which constitute a method; that is, the principles of a "critical methodology." The reason for this appeal is the following. Popper is
convinced that since inductive inferences cannot be justified, we must turn to the model of deductive inference. By shifting to the deductive model of inference, we can be justified, in terms of preference, in making judgments about the world. By using the deductive model of inference, Popper believes that if we can show, for instance, one of two theories to be false, we are justified in preferring the theory which has not yet been falsified.\footnote{His solution to the traditional philosophical problem of induction, as it was noted in chapter one of this paper, "falls entirely within the scope of deductive logic."} Popper notes, though, that it is "... always possible to 'immunize' any theory against criticism..." and hence he is "... led to the idea of methodological rules..."\footnote{It is Popper's position, then, that an appeal to rules must be made to ensure the proper or valid application of deductive inference to our theories about the world. An appeal to these rules, then, constitutes a critical methodology by which a rational course of action can be determined.} Given Popper's characterization of a rational course of action as one that is determined by rules, the following questions become relevant. Does it make sense to appeal to principles or rules to determine a rational course of action? Can we define a practice, like science, as rational by its adherence to certain principles? This question presupposes the more basic question: Can rules, in and of
themselves, direct any course of action? By noting Wittgenstein's observations on what it is to follow a rule, the following can be seen: Since no course of action can be solely guided or determined by rules, it is unwise to define rationality in terms of adherence to rules.

To demonstrate the claim that it is unwise to assess rationality in terms of rules, this chapter will be composed of two sections. The first section will outline Wittgenstein's criticism of one explanation of what it is to follow a rule. This position, which will be spelled out in detail later, holds that there is a great deal "hidden" in the activity of following a rule. What is hidden are mental acts and it is these mental acts that must be referred to for an explanation of what it is to follow a rule. It is Wittgenstein's opinion there is no evidence for the existence of such mental acts and that an explanation of what it is to follow a rule must, as a result, refer to something other than hidden processes. For instance, it is Wittgenstein's view that to follow a rule is to act in accordance with, for example, a formula. The purpose of the second section, then will be to explicate Wittgenstein's position on what it is to follow a rule.

1. Wittgenstein's investigations into what it is to follow a rule

It cannot be denied that, in great part, our lives consist in "following" rules. Neither can it be denied
that if we did not follow rules, we would have a very difficult time living our day-to-day existence. That is, the rules for driving a car on the highway, the rules for balancing a bank statement, and countless other rules guarantee for us a smooth and efficient character to our everyday activities. We cannot, then, live without living by rules that we all agree to and all follow in the same manner. We do live by rules and it would be a very strange life indeed that was not structured, or determined, by rules.

What is it, then, we can ask, to follow a rule? How is it to be explained, for example, that the mathematical calculations all of us perform exhibit a consensus of result? For instance, Wittgenstein wonders about the "peculiar inexorability of mathematics." Is it our knowledge of formulae and rules for their application that determines our success in calculating? Do formulae stand apart from our activities and direct them along their true courses? Wittgenstein considers these questions and similar questions by taking a look at the manner in which we are taught to follow a rule. From these observations, he attempts to explain the peculiar inexorability of calculating, in particular, and, in general, of following or obeying a rule.

For example, Wittgenstein asks us to consider a situation in which a student is learning the series of natural numbers according to a certain formulation rule.
An explanation of what it is for the student to follow the formulation rule correctly might take the following form: "In order to follow a rule correctly a person must intuit the right step." That is to say: "The right step is the one that accords with the order— as it was meant. The correct step at every point is that which is in accordance with the rule as it was meant, intended." Hence, it is what might be called the "act of meaning" or the "act of intention" which determines the proper step to be taken in the series. The student intuits the rule or formula that is meant, and acts in accordance with this intuition.

Wittgenstein holds that this explanation of what it is to follow a rule is inadequate. For instance, he states that the idea behind this characterization "... is connected with a peculiar use of the word 'to mean'." Wittgenstein expresses the idea behind this characterization in the following manner. He writes:

The expression "The rule meant him to follow up 100 by 101' makes it appear that this rule, as it was meant, foreshadowed all the transitions which were to be made according to it. 88, pp. 142-3.

Wittgenstein's expression of the idea behind the "meaning-intention" explanation of following a rule can be explicated in the following manner. Wittgenstein considers the possibility of what it is to mean or intend the rule that is to be followed. Is it, he asks, that when the order "+n" is given it is meant that the student intuits the cor-
rect step, for example, to be 1002 from 1000? And is it that the intention behind this order is such that the student follows 1866 with 1888, or 3 with 5 and so on; i.e., do an infinite number of like calculations follow from the intended meaning of the order? Wittgenstein asks, then, how it is that "... you do all these acts of meaning (I suppose an infinite number of them) when you gave him the rule?" For example, Wittgenstein wonders, can this intending be seen as a type of mental act in which one says to oneself "I want him to write 101 after 99," and so on — and so on — and somehow this intention is projected into the future so that the student may correctly intuit the rule each time he has occasion to use it?

One might object to Wittgenstein's preceding description of the meaning-intention characterization of what it is to follow a rule in the following manner. Wittgenstein writes:

No: what I meant was, that he should write the next but one number after every number that he wrote; and from this all those propositions follow in turn. *PI*, #186.

That is to say, the student's correct application of the rule does not follow from any future projection of intuited intention or meaning. The student intuits the intention initially as a general rule and from this he is capable of carrying out the series correctly. There is, then, only the one act of meaning which is intuited and
all the other correct applications of the rule follow from it.

To this reply Wittgenstein retorts:

But that is just what is in question: what, at any stage, does follow from that sentence. Or, again, what, at any stage we are to call 'being in accord' with that sentence (and with the mean-ing you then put into the sentence - whatever that may have con-sisted in). PI, #186.

Here Wittgenstein is interested in pointing out that the correct step is not correct because it "follows cor-rectly" from the order as it was meant. To think that, he states, is to be "... misled by the grammar of the words 'know' and 'mean'." For example, one might answer: "But I already knew, at the time when I gave the order, that he ought to write 1002 after 1000." That is to say: "If I had been asked what number should be written after 1000, I should have replied '1002'." Wittgenstein is willing to agree that it is possible to know how an order is meant. Although, he wants to say that it is not possible to know how an order is meant if one thinks that this knowing is a kind of mental state, which can then be intuited correctly by the person follow-ing the order. Wittgenstein explains what he thinks is wrong with this idea in the following. He states:

Here I should like first of all to say: your idea was that that act of meaning the order had in its own way already traversed all those steps: that when you meant it your mind as it were flew ahead and took all the steps before you physically arrived at this or that one.
Thus you were inclined to use such expressions as: 'The steps are really already taken, even before I take them in writing or orally in thought.' And it seems as if they were in some unique way predetermined, anticipated — as only the act of meaning can anticipate reality. PI, §188.

Hence Wittgenstein brings to our attention the uses of the words "to know" and "to mean" for the following reason. Just as we are tempted to think that "to know" denotes a mental state or mental act\textsuperscript{14} we are tempted to think that "to mean" denotes a similar state — i.e., one in which the mind flies ahead and takes all the correct steps. To say that one knows when a rule is given that that rule is meant to direct a certain action in a certain manner, is to say that meaning—the-rule or intending—the-rule determines each step to be taken in the calculus. It is as if, Wittgenstein writes, the "... rule, once stamped with a particular meaning, traces the lines along which it is to be followed throughout the whole of space."\textsuperscript{15}

Wittgenstein has asked, then, what it is to "be in accord" with the meant or intended order. This is the question that is pivotal to the issue at hand. For instance, Wittgenstein wants to say that the correct execution of a series of numbers does not follow from a meaning or intending act on the part of the instructor. The question must be asked, though, precisely why does nothing follow from the intention of the instructor? The answer, it can be seen, is this: It is not evident that anything follows. That is, what is pivotal to an explanation of
what it is to follow a rule is a criterion that can be used to tell us, in this case, what the instructor does intend. The remainder of this section will outline Wittgenstein's search for a criterion that can be used to make it evident what an instructor intends or means and, in addition, a criterion that can be used to make it evident that the student understands an instructor's orders.

To explain what it is to follow a rule in terms of an "intuition of intention," Wittgenstein has stated, arises from a grammatical confusion. That is, to think of meaning or intention as a mental state, Wittgenstein is anxious to show, offers the student no possibility of a criterion for intuiting the instructor's intention. For example, what is it to have the intention to play a game of chess?

Wittgenstein writes:

There is no doubt that I now want to play chess, but chess is the game it is in virtue of all its rules (and so on). Don't I know, then, which game I want to play until I have played it? or are the rules contained in my act of intending? so it is impossible for me to be certain what I am intending to do? And if that is nonsense - what kind of super-strong connexion exists between the act of intending and the thing intended? - Where is the connexion effected between the sense of the expression 'let's play a game of chess' and all the rules of the game? - Well, in the list of the rules of the game, in the teaching of it, in the day-to-day practice of playing. PI, #197.

Wittgenstein, then, notes this position. It is the position that one cannot be certain of an intention without looking into the mind where, so to speak, the intention
resides. According to this position, the intention to play the game of chess might be, for example, in the form of the rules of the game that are present to the mind. This position might be characterized in the following manner.

Wittgenstein writes:

But it is just the queer thing about intention, about the mental process, that the existence of a custom, of a technique, is not necessary to it. That, for example, it is imaginable that two people should play chess in a world in which otherwise no games existed; and even that they should begin a game of chess – and then be interrupted.

But isn't chess defined by its rules? And how are these rules present in the mind of the person who is intending to play chess? PI, #205.

In the above passage, Wittgenstein brings to the forefront the following question. If intending is a mental process, in which the list of the rules of the game may be present to the mind, how is it possible to be certain of the intention or "how are these rules present in the mind of the person who is intending to play chess?" To see intention as a mental process admits of no evident connection between the intention and the thing intended. To have the intention of playing a game of chess is both separate from and not dependent on the actual playing of the game or, in Wittgenstein's words, "the existence of a custom, of a technique, is not necessary to it." Hence, if we are to be certain of an intention, and if that intention is separate from the thing intended, we are left with the "mental state" as the source of our certainty. We must look into
the mind to perceive that mental process. Wittgenstein notes that this is not possible. He writes:

The grammar of a mental state or process is indeed in many respects similar to that of e.g. a brain-process. The principal difference is perhaps that in the case of a brain-process a direct check is admitted to be possible; the process in question may perhaps be seen by opening the skull. But there is no room for a similar "immediate perception" in the grammar of mental process. *(There is no such move in this game.)* PG, #82.

An 'inner process' stands in need of outward criteria. PI, #580.

It is a confusion, Wittgenstein has stated, over the grammar of the word "to intend" which leads one to suppose that to intend something is to perform a mental act. We say "I intend...", or "He intends..." and it seems here that the intending must be a mental act. But when one thinks about intending in this manner one supplies oneself with a "one-sided diet."*16 One forgets the other uses of the word "intention." For example, Wittgenstein writes:

In what circumstance does one say 'This appliance is a brake, but it doesn't work.'? That surely means: it does not fulfill its purpose. What is it for it to have this purpose? It might also be said: "It was the intention that this should work as a brake." Whose intention? Here intention as a state of mind entirely disappears from view. *2, #48.*

To rely on a one-side diet or to use only one type of example of the use of a word can lead us down a dead-end street. That is, by committing ourselves to the mental act view of intention, we are left with no criterion by which to know the intention. We can know, we can be certain of an intention, if we can see the intention being played
out. The connection, then, between the intention and that which is intended is public. The student, as a result, can be certain of what the instructor intends only when the intention is made public, or evident - i.e., when the rule is applied thus. Wittgenstein writes:

One would like to ask: 'Would someone who could look into your mind have been able to see that you meant to say that?'

Suppose I had written my intention down on a slip of paper, then someone else could have read it there. And can I imagine that he might have in some way found it out more surely than that? Certainly not. 2, #36.

Hence, we have seen that for the student to "be in accord" with the instructor's intention, the student must have recourse to a criterion or a standard by which the intention can be judged or known. We have seen, by noting Wittgenstein's observations on the grammar of the word "intention," that this standard is not available if we are to think of the phrase "I intend" as a report of a mental state or an activity of the mind which the student can only be certain of by intuition. 17 The standard, then, is in the application, the physical act of writing down a sufficient portion of the series on a piece of paper, for example. 18

The same conclusion can be reached when we observe the grammar of the word "to mean." For example, Wittgenstein writes that to "... understand the grammar of the word 'to mean' we must ask ourselves what is the criterion for an expression's being meant thus." 19 The problem is, in
Wittgenstein's words, "... how are we to judge whether someone meant such-and-such?" He answers:

The fact that he has, for example, mastered a particular technique in arithmetic and algebra, and that he taught someone else the expansion of a series in the usual way, is such a criterion. *PI*, #692.

It may now be said: 'The way the formula is meant determines which steps are to be taken.' What is the criterion for the way the formula is meant? It is, for example, the kind of way we always use it, the way we were taught to use it. *PI*, #190.

The instructor's "act of meaning," then, can be said to reside not in the mind, but in the application. It is in this latter sense that the rule can be said to be meant in such-and-such a way.

The phenomenon of following a rule can be seen, when the emphasis is placed on how we learn to follow rules, as a two-dimensional affair. That is, the normally fluid act of following a rule can be analyzed by explaining on the one hand how the instructor can intend a rule to be followed in a certain way, and, on the other hand, explaining the student's understanding of that intention — i.e., how is it that the student follows a rule correctly? The concept of "understanding," then, must now be considered in order to obtain a full view of what it is to follow a rule.

Wittgenstein brings it to our attention that when an order is given it is possible to think there is a step that must be taken between the giving of the order and its execution. He notes the following position.
There is a gulf between an order and its execution. It has to be filled by the act of understanding.

Only in the act of understanding is it meant that we are to do THIS. The order—why, that is nothing but sounds, ink marks. *PI*, #431.

Taking in account the above position, we can consider the following language-game: "... when A gives an order B has to write down series of signs according to a certain formulation rule." A might attempt to get B to understand the series of natural numbers by writing them down on a blackboard and having B copy them. After a certain amount of time B manages to successfully continue the series to 100. Wittgenstein writes:

Suppose I now ask: "Has he understood the system when he continues the series to the hundredth place?" Or—if I should not speak of 'understanding' in connection with our primitive language-game: Has he got the system, if he continues the series correctly so far?—Perhaps you will say here: to have got the system (or, again, to understand it) can't consist in continuing the series up to *this* or *that* number: *that* is only applying one's understanding. The understanding itself is a state which is the source of the correct use. *PI*, #146.

From the above passage, we find Wittgenstein outlining the following explanation, which he will criticize, of what it is for the student to follow a rule correctly. When a student successfully completes a series (e.g., of natural numbers) according to a rule, his understanding of that rule is itself a process, or a state, which "fills the gap" between the instructor's order and the actual execution of that order. The understanding of a student, then, is an act
which must be performed in what can be seen as a three step process: i) order, ii) act of understanding, and iii) execution of order. The second step in this process is the source of the correct execution of the order. The idea, Wittgenstein states: "... is that you know the application of the rule quite apart from remembering actual applications to particular numbers."22

Wittgenstein concentrates his attention on the above explanation of what it is to follow a rule properly by investigating the second step in the activity of following a rule: the "act of understanding." For example, he asks us to image the following game in which it can be said that a rule is "understood." He writes:

A writes a series of numbers down; B watches him and tries to find a law for the sequence of numbers. If he succeeds he exclaims: 'Now I can go on!' - So this capacity, this understanding, is something that makes its appearance in a moment. So let us try and see what it is that makes its appearance here. - A has written down the numbers 1, 5, 11, 18, 29; at this point B says he knows how to go on. What happened here? Various things may have happened; for example, while A was slowly putting one number after another, B was occupied with trying various algebraic formulae on the numbers which had been written down. After A had written the number 19 B tried the formula a = n^2 + n - 1; and the next number confirmed his hypothesis.

Or again, B does think of the formulae. He watches A writing his numbers down with a certain feeling of tension, and all sorts of vague thoughts go through his head. Finally, he asks himself: 'What is the series of differences?' He finds the series 4, 6, 8, 10 and says: Now I can go on.

Or he watches and says 'Yes, I know that series' - and continues it, just as he would have done if A had written down the series 1, 3, 5, 7, 9. - Or he says nothing at all and simply continues the series. Perhaps he had what may be called the sensation 'that's easy!' (Such a
sensation is; as when one is slightly startled. \( PI, \#151. \)

But are the processes which I have described here understanding? 'B understands the principle of the series' surely doesn't mean simply: the formula '\( a_n = \ldots \)' occurs to B. For it is perfectly imaginable that the formula should occur to him and that he should nevertheless not understand. \( PI, \#152. \)

In the above passages, Wittgenstein describes a number of instances that can be called instances of understanding. For example, the student might exhibit an understanding of a series through the use of a formula, or by noting the series of differences, or by analogy, or by simply continuing the series in such a way that we would be inclined to say that nothing at all went through his mind.\(^{23}\) He also notes that it might be possible for a student to be aware of a formula from which the series could be derived and still be incapable of continuing the series. Taking into account these instances, Wittgenstein wonders if we should call them instances of understanding or instances in which an "act of understanding" is the source of the proper continuation of the series. To think of understanding as an act which is the source of the proper continuation of the series is, as Wittgenstein has pointed out, to have the idea that the application of the rule is known by the student aside from any "actual applications to particular numbers." The proper application of the rule is known to the student aside from any past experience. Wittgenstein questions this
idea in the following passage. He writes:

But what does this knowledge consist in? Let me ask: When do you know that application? Always? day and night? or only when you are actually thinking of the rule? do you know it, that is, in the same way as you know the alphabet and the multiplication table? Or is what you call 'knowledge' a state of consciousness or a process - say a thought of something, or the like? PI, #148.

Given the above passage, the preceding explanation of what it is for a student to follow a rule properly can be questioned in the following manner. If following a rule correctly is a three step process, and the second step is an act of understanding in which knowledge of the application of the rule is present, what is the nature of this knowledge? Do I, for example, understand a word continuously - day to day, week to week, etc. . . . Surely not. 24 For we have already seen, when actual instances of understanding were looked at, that the student might exhibit an understanding by utilizing a rule, but then he might exhibit an understanding in which no rule is utilized, and, finally, the student might be aware of a rule but not know how to continue the series with it. Are we to say that this "knowledge" is a thought or a mental state? If we want to speak of a state of mind here, Wittgenstein tells us, then " . . . there ought to be two different criteria for such a state: a knowledge of the construction of the apparatus, quite apart from what it does." 25 That is, there ought to be a way to distinguish the supposed "source" of the under-
standing, the thought, from the understanding itself, its "expression." But it has already been seen, in the investigation of "meaning" as a mental act, that "... there is no room ... for an immediate perception in the grammar of mental process." The writing down of the series "... is itself the vehicle of thought." Wittgenstein states:

The grammar of the word 'knows' is evidently closely related to that of 'can,' 'is able to.' But also closely related to that of 'understands.' ('Mastery' of a technique). PI, #150.

Hence, the student can be said to understand the application of a rule, not in terms of a hidden mental act, but in terms of his ability to develop a series of numbers according to that rule. The student's understanding can be seen in terms of "mastery of technique." Wittgenstein writes:

When someone interprets, or understands, a sign in one sense or another, what he is doing is taking a step in a calculus.* PG, p. 51.

The understanding of a language, as of a game, seems like a background against which a particular sentence acquires meaning. But this understanding, the knowledge of the language, isn't a conscious state that accompanies the sentences of the language ... Its much more like the understanding or mastery of a calculus, something like the ability to multiply. PG, p. 50.

Wittgenstein tells us a student gets to understand a series of numbers, for example, pedagogically. The instructor may write the first of the series for the student to inspect and the "... possibility of getting him to
understand will depend on his going on to write it down independently. If the student makes a mistake, if he continues the series in a way other than the instructor would, he will be corrected. The teacher may grunt at the student when a mistake is made, or smile when the series is being carried out properly, or the teacher may try to explain a formulation rule to the student, but the important thing is the student's reaction. This indicates the student's ability to master the technique and it also shows the limits of his understanding. Wittgenstein states:

Following a rule is analogous to obeying an order. We are trained* to do so; we react* to an order in a particular way. PI, §205.

Thus, to ask how it is that the student's understanding of a rule is to be explained, or how it is that the student follows a rule correctly, is to point to the student's reaction. And the student's reaction can only be the application he makes of the rule. It is not, it would seem, an "act of understanding" that we must look to for an explanation of what it is for the student to follow a rule correctly. It is the student's reaction or application of the rule that is the criterion of his understanding.

Given the preceding observations, a conclusion identical to that reached by an investigation of meaning and intending can be formulated. The student's "act of understanding" can be said to reside not in the mind, but in the
application. It is in this latter sense that the rule can be said to be understood in such-and-such a way. To conclude this section, we can note that Wittgenstein's investigation into what it is to follow a rule can be seen to be centered around the search for a criterion. For Wittgenstein, there must be a criterion to make it evident what someone does mean and that someone does understand something. The position Wittgenstein criticizes in his investigations makes reference to hidden mental acts for an explanation of what it is to follow a rule. Wittgenstein considers this position and finds that if an explanation of what it is to follow a rule is to make such references, we are left in a precarious position. That is to say, we have no way of knowing or being certain of what someone intends or whether someone understands something. Hence, an explanation by reference to mental activities is not adequate. Wittgenstein finds, though, that if we refer to the application of meaning and understanding we find a criterion by which we can be certain of an intention or of an understanding. It is important to note that what Wittgenstein has done by discovering an adequate criterion is to take the activities of meaning and understanding out of the realm of private experience and to emphasize the public nature of these activities. This discovery might be seen as a clue to the formulation of an adequate explanation of
what it is to follow a rule.

2. Wittgenstein's explanation of what it is to follow a rule.

It has been shown in the preceding section that an explanation of what it is to mean or intend a rule, and to understand it, is to point to application as the criterion. It is Wittgenstein's conclusion, then, that the measure of whether or not someone means something or understands something is the application of that meaning or understanding. That, of course, is not to say we would not accept anything but the application as the criterion. For instance, Wittgenstein's investigation into what it is to follow a rule is directed at the teaching and learning of rules. It is at this primitive stage that we would want to accept application as the criterion of, for example, understanding. We might ask a student if he understands a particular series of numbers and the student's understanding might be indicated, not by continuing the series, but by giving us a correct formulation rule for the series. But, we would accept the giving of a rule as an indication of understanding only after a certain amount of stage setting has taken place. That is, only after the student has demonstrated his ability or capacity for continuing series of numbers. Wittgenstein writes:

With the words "this number is the right continuation of this series" I may bring it about that for the
future someone calls such-and-such the 'right continuation.' What 'such-and-such' is I can only show in examples. That is, I teach him to continue a series (basic series), without using any expression of the 'law of the series'; rather, I am forming a substratum for the meaning of algebraic rules or what is like them. 

That is, before the student is capable of using a rule or asking for a rule he must be capable of mastering the technique of continuing a series of numbers. He must already know the language-game of calculation. Hence, if we are to accept the student's offer of a formulation rule for the continuation of a series as an indication of his understanding that series, we must be certain he is capable of demonstrating to us the correct application of that rule. (This certainty may come about, for example, from observing the student's past successes in utilizing formulation rules for the correct continuation of a series of numbers). It is the application of the rule, then, and not knowledge of the rule itself that, in the final analysis, evidences the student's understanding.

It can be seen, in addition, that it is not the rule by itself that determines the student's correct continuation of a series, but the student's application of the rule. That is, the emphasis is now shifted from the student's understanding of a rule to the role of a rule in determining a series of numbers, or a course of action. For instance, Wittgenstein's objector asks: "But are the steps then
not determined by the algebraic formula?" Wittgenstein answers:

We use the expression: 'The steps are determined by the formula. . . . ' How is it used? - We may perhaps refer to the fact that people are brought by their education (training) so to use the formula $y=x^2$, that they all work out the same value for $y$ when they substitute the same number for $x$. Or we may say: "These people are so trained that they all take the same step at the same point when they receive the order 'add 3'." We might express this by saying: for these people the order 'add 3' completely determines every step from one number to the next. (In contrast with other people who do not know what they are to do on receiving this order, or who react to it with perfect certainty, but each one in a different way).

On the other hand, we can contrast different kinds of formula, and the different kinds of use (different kinds of training) appropriate to them. Then we call formulae of a particular kind (with the appropriate methods of use) 'formula which determine a number $y$ for a given value of $x$', and formula of another kind, ones which 'do not determine the number $y$ for a given value of $x$'. PI, #189.

Hence, we refer to a student's application of a rule when we use the expression "The formula determines the steps. . . ." That is, as Wittgenstein points out in the preceding passage, we refer to that student's training. The rule, together with its application, as a result of training, determines both the meaning of the rule and the student's understanding of it. All of this is required for the determination of a series of numbers. The rule, that is, does not "stand apart" from the student's actions. Its meaning and the understanding of it cannot be separated from the actual steps taken in the continuation of the series. This is to say that a rule by itself is void of
content and, hence, it is not capable of directing activity. To use an analogy, Wittgenstein asks: "How does it come about that the arrow points?" He answers: "The arrow points only in the application that a living being makes of it." 37

A rule, for Wittgenstein, stands like a "sign-post." 38 It is something we react to and do not interpret. For instance, Wittgenstein notes that "... because every course of action can be made out to accord with a rule ..." no course of action can be guided by a rule. 39 For example, one might be ordered to walk in a certain direction by the use of an arrow. Wittgenstein asks: "Couldn't such an order be interpreted to mean that the man who gets it is to walk in the direction opposite to that arrow?" He answers:

This could obviously be done by adding to our arrow some symbols which we might call 'an interpretation.' It is easy to imagine a case in which, say to deceive someone, we might make an arrangement that an order should be carried out in the sense opposite to its normal one. 88, p. 33.

Hence, "... there would be neither accord nor conflict here." 40 That is to say, if we follow a rule according to some interpretation we make, in what manner is it to be explained how we follow rules 41 or how is the "peculiar inexorability" of mathematics to be explained? Wittgenstein writes:

'But how can a rule shew what I have to do at this point? Whatever I do is, on some interpretation, in accord with the rule.' - That is not what we ought to say, but rather: any interpretation still hangs
in the air along with what it interprets, and cannot
give it any support. Interpretations by themselves
do not determine meaning. PI, #198.

What this shews is that there is a way of grasping a
rule which is not an interpretation, but which is ex-
hibited in what we call 'obeying a rule' and 'going
against it' in actual cases. PI, #201.

What is exhibited in actual cases of "obeying a rule"
and "going against it" is a reaction. Wittgenstein states:

Let me ask this: what has the expression of a rule -
say a sign-post - got to do with my actions? What sort
of connexion is there here? - . Well, perhaps this one:
I have been trained to react to it. PI, #198.

One reacts, then, to a particular sign in a particular
way because one is trained to do so. One does not inter-
pret the sign, for "... to interpret is to think, to do
something ..." Wittgenstein states:

When I obey a rule, I do not choose. I obey the rule
blindly, PI, #219.

It has been seen, then, that a rule is something
meaningless apart from its application, it is something
one reacts to and does not interpret, and, finally, one's
reaction comes about as a result of one's training. The
question remains, though, how is one to judge a reaction
as the "correct" one? How is one to know if a rule is
being followed correctly? For instance, Wittgenstein's
objector asks: "But what if one person reacts in one way
and another in another to the order and the training?
Which one is right?" Wittgenstein answers:

The words 'right' and 'wrong' are used when giving
instruction in proceeding according to a rule. The
word 'right' makes the pupil go on, the word 'wrong' holds him back. Now one could explain these words to a pupil by saying instead: 'this agrees with the rule—that not'?' Well yes, if he has a concept of agreement. But what if this has yet to be formed? (The point is how he reacts to the word 'agree'.)

One does not learn to obey a rule by first learning the use of the word 'agreement.' Rather, one learns the meaning of 'agreement' by learning to follow a rule. *RFM*, p. 183:32.

The word 'agreement' and the word 'rule' are to one another, they are cousins. If I teach anyone the use of the one word, he learns the use of the other with it. *PI*, #224.

A pupil learns what is "right" and what is "wrong" just as naturally as he learns to react to a sign-post (follow a rule), or, at least, that is the object of the instructor. A case in which one understands an order as the instructor understands it, Wittgenstein notes, presents a similarity with the case "... in which a person naturally react[s] to the gesture of pointing with the hand by looking in the direction of the line from finger-tip to wrist, not from wrist to finger-tip." If the student does not react as *we do* he must either be forced or persuaded to do so. That is, he must be trained to react to an order (or rule) correctly, for the system of reference is the "common behaviour of mankind." Wittgenstein states:

In order to make a mistake, a man must already judge in conformity with mankind. *OC*, #156.

We are trained, then, such that our common reactions constitute our agreement to go on in the same way or our
agreement on what it is to follow a rule correctly or incorrectly. (Both concepts, 'agreement' and 'rule,' are learned, it might be said, simultaneously.) Wittgenstein states:

... a person goes by a sign-post only in so far as there exists a regular use of sign-posts, a custom.* P1, #198.

Is what we call 'obeying a rule' something that it would be possible for only one man to do only once in his life? - This is of course a note on the grammar of the expression 'to obey a rule.'
It is not possible that there should have been only one occasion on which a report was made, an order given or understood; and so on. - To obey a rule, to make a report, to give an order, to play a game of chess, are customs (uses, institutions). P1, #199.

And ... also 'obeying a rule' is a practice.* P1, 202.

To conclude, it was stated at the end of the first section of this chapter that Wittgenstein's investigations into the activities of intending, meaning, and understanding provide a clue to an adequate account of what it is to follow a rule. This can be explained in the following manner. The nature of the aforementioned activities Wittgenstein has described as public. This is to say that only in the application can we be said to be certain of someone's intention or understanding. It has been shown in this section that to refer to one's application of, for example, a rule, is to refer to one's training. One applies a rule in such-and-such a way because one has been trained in such-and-such a way. It has also been shown, for instance, when a student
is trained to apply a rule in such-and-such a way that rule takes on meaning or sense. It is at this point that a rule can be said to have the capability to direct an action or an activity. It is at this point that the rule has content. It might also be noted a student is trained, not to interpret, but to react to an order (rule) and to react to it in the same way as his fellow members in the community (to follow a rule correctly is to go on in the same manner).

When a community shares common reactions to orders, as Wittgenstein points our, it forms a custom or a practice. A custom or practice, for the purpose at hand, can be described in terms of "common technique." For example, mathematicians share the same reactions to the signs "+" and "=". That is to say, mathematicians have mastered the technique of applying these signs in a similar manner every time they have occasion to use them. To follow a rule, then, is to share a technique which is a public endeavour. Hence, to point to the public nature of activities such as intending, meaning, and understanding - concepts we use to explain what it is to follow a rule (to explain the 'peculiar inexorability' of following a rule) - is, consequently, to point to the public nature of following a rule. Our common applications of rules, then, can only be explained in terms of shared technique.

According to Wittgenstein, it can be said that we do
not act in accordance with rules, but, rather, with the manner in which they are applied. As a result, our actions constitute a custom or a practice.

Summary

In the introduction to this chapter, it was stated that, from a Wittgensteinian point of view, Popper's version of rationality is insufficient. That is, it was stated: 'Since no course of action can be solely guided, or determined, by rules, it would be unwise to assess rationality in terms of adherence to rules.' These statements will be defended by explaining how Popper's version of rationality is insufficient.

Popper holds that a rational course of action is one that is in accordance with the principles of a critical methodology \( P_2 \). A rational course of action, in \( P_2 \)'s simplest form, is one that is determined by principles or rules. Wittgenstein, though, has shown us that no course of action can be determined solely by rules. This is to say, of course, that if no course of action can be determined solely by rules, neither can a rational course of action be so determined. The questions that this summary must address, then, are the following: 1) What does determine a course of action? and 2) How does the answer to 1) point to the insufficiency of Popper's version of rationality?
The answer to 1) has already been given. Because rules can be interpreted in various and contradictory ways, they cannot guide a course of action. The idea that a course of action is determined by adherence to rules is an idea, then, that must be rejected. This idea does not offer us an adequate explanation of what it is to follow a rule. A rule, Wittgenstein has shown us, does not stand apart from and guide activity but, rather, receives its content, or meaning, by the manner in which it is applied. The manner in which it is applied is a result of training and as a result, the application of a rule is better explained in terms of mastery of technique. Hence, how a course of action is determined is inseparable from an adherence to a technique or a way of reacting to "sign-posts."

How, then, does the conclusion that a course of action cannot be solely explained in terms of rules point to the insufficiency or Popper's version of rationality? Surely, we do not want to say that a rational course of action is one that ignores principles or rules. We can say, though, that there is a sense in which principles cannot account for or justify our actions, or our actions as being rational. For instance, Wittgenstein states:

Not only rules, but also examples are needed for establishing a practice. Our rules leave loop-holes open, and the practice has to speak for itself. OC, #139.
Hence, in the absence of any reference to practice or custom, Popper's version of rationality - adherence to rules and no mention of technique for their application - can be said to be void of meaning-content, for it can direct no course of action. Popper's version of rationality is insufficient because, as it stands, it leaves "loop-holes" open and, as result, cannot fully explain or justify a course of action. $P_2$, then, is not credible.
Chapter III


2 Ibid., p. 30.


5 Ibid., #186.


7 Ibid., p. 142.

8 Wittgenstein, PI, #186.

9 Wittgenstein, BB, p. 142.

10 Ibid.

11 Wittgenstein, PI, #187.

12 Ibid.

13 Ibid.

14 Ibid., #363.

15 Ibid., #219.

16 Ibid., #593.

17 Note also: PI, #213.

18 "Now, however, let us suppose that after some efforts on the teacher's part he continues the series correctly, that is, as we do it. So now we can say he has mastered
FOOTNOTES – cont’d.

Chapter III

the system. – But how far need he continue the series for us to have the right to say that? Clearly you cannot state a limit here.” PI, #145.


20 Wittgenstein, PI, #692.
21 Ibid., #143.
22 Ibid., #147.
23 Ibid., #179.
24 Ibid., #58.
25 Ibid., #149.
26 Ibid., #329.


28 Wittgenstein, PI, #143.
29 Ibid., #206.
30 Ibid., #145.
31 Ibid., #143.
32 Ibid., #146.

33 This conclusion could also be formulated in the following manner: Once application is seen as the criterion of understanding, the second step in the three step process of following a rule correctly no longer seems necessary.

34 Wittgenstein, PI, #146.
35 Wittgenstein, OC, #45; see also PI, #257.
36 Wittgenstein, PI, #189.
FOOTNOTES - cont'd.

Chapter III

37 Ibid., #454.

38 Ibid., #85, 87.

39 Ibid., #201.

40 Wittgenstein, PI, #20]

41 "The point is we can think of more than one application of an algebraic formula; and every type of application can in turn be formulated algebraically; but naturally this does not get us any further." PI, #146.

42 Ibid., #212.

43 Ibid., #206.

44 Ibid., #185.

45 Ibid., #206.
CHAPTER IV

GROUNDS, CERTAINTY, AND PRACTICE

Introduction

The purpose of this chapter will be to defend the thesis of this paper. Although new material will be introduced, the defence of the thesis will depend largely on the material found in the preceding three chapters. The method of defence will be to divide the thesis statement into two parts. The first section of this chapter will argue for the first part of the thesis statement and the second part of the thesis statement will be argued for in the final section of the chapter.

1. "Karl Popper's idea of rationality arises from a misunderstanding of the concept of justification."

It is Popper's position that there is a problem behind the traditional philosophical problem of induction. That is, the traditional philosophical problem of induction, Popper notes, receives its life from a search for a justification of inductive inferences. Popper points out that the search is futile because a justification for inductive
inferences is logically impossible (1:1-3).* As a result, Popper directs his attention to what he considers the more fundamental problem and its solution. The more fundamental problem, for Popper, is man's rationality.

This problem arises from what Popper refers to as a "clash" between psychology and logic. That is, Popper notes, most reasonable people believe that the future will conform to the past, but he also notes that this belief, from a logical point of view, cannot be justified. Popper concludes that since even the most commonsensical beliefs, such as "that the sun will rise tomorrow," cannot be justified, man finds himself in the position of being fundamentally irrational (1:3-4).

Popper's problem, then, inherent in the traditional philosophical problem of induction involves around the concept of justification. Consequently, Popper's solution to the traditional philosophical problem of induction is to offer us a way to justify our judgements about the world. Popper holds that we can be justified in holding a belief about the world by utilizing a method of preference. That is, given any two beliefs about the world, if the falsity

*This scheme will be used throughout this chapter to make reference to material previously covered. The first number denotes the chapter number and the second number(s) denotes page number.
of one of those beliefs can be established and the falsity of the other cannot be established, then we are justified in assenting to the latter (1:5-6).

What does Popper's solution to the traditional philosophical problem of induction amount to? It does not, of course, amount to a valid inductive principle, for, as Popper notes, the formulation of a valid inductive principle is a logical impossibility. Popper's solution, rather, addresses itself to what he sees as the implication of the impossibility of formulating a valid inductive principle: man's fundamental irrationality. "Our 'knowledge'," Popper notes from Hume's conclusion that repetition has no power as an argument, "is unmasked as being not only of the nature of belief, but of a rationally indefensible belief--of an irrational faith." (1:3).

As it was shown in chapter two, Wittgenstein does not think there is a problem behind the traditional philosophical problem of induction. Rather, he wonders whether or not the traditional philosophical problem of induction itself is a genuine problem. He investigates the "problem" of the justification of inductive inferences in quite a different manner than Popper. Whereas Popper sees the traditional philosophical problem of induction as a problem to be solved, Wittgenstein sees the problem as one to be resolved, or a problem to be analyzed and dissipated.
Wittgenstein's method is to question Popper's understanding of the problem. Wittgenstein asks Popper (or the student of Popper) to fill out his reasons for holding that it is irrational to believe that something will happen in the future because it has done so in the past (2:1-5). Wittgenstein wants to know if there are any good reasons for questioning our belief in what might be called the "principle of the uniformity of nature" (2:7-8). Wittgenstein finds that it does no good to answer: "Because the principle of uniformity of nature cannot be justified."

That is, Wittgenstein finds that Popper is misled into thinking that every belief that we hold must be justified, and, as a result, does not realize that a belief in the uniformity of nature is one with a unique character and status. Wittgenstein finds that the belief in the uniformity of nature does not call for justification but, rather, it should be treated as an attitude that is not reasoned to and one that reasons are not normally given for.

Wittgenstein also finds that the belief in the uniformity of nature plays a special role in the foundations of our language-games. If this belief did not play the role it does in our language-game of justification, the practice of justification, as we normally understand it, could not be carried out. The belief in the uniformity of nature is logically prior to, or presupposes the practice of justification (2:8-15).
For Wittgenstein, then, justification must come to an end. There is a point, he says, where reasons cease to make sense and one says "This is simply what I do." Hence, the traditional philosophical problem of induction, since it revolves around a mistaken notion of justification, is not a genuine philosophical problem.

How, though, does saying "this is simply what I do" resolve the problem that Popper attempts to solve? We might begin by noting that it is Wittgenstein's desire to bring it to our attention that to base future expectations on past experiences, to "simply do this," is a form of life. With this observation of Wittgenstein's, it will be argued that the traditional philosophical problem of induction can be resolved.

A form of life, for Wittgenstein, "... lies beyond being justified or unjustified; as it were, as something animal." He states:

What has to be accepted, the given, is - so one could say - forms of life. *Pf*, p. 227.

A language-game is a form of life. It is "something animal" in that it is an extension of primitive behaviour. A language-game, that is, is behaviour. Wittgenstein writes:

You must bear in mind that the language-game is so to say something unpredictable. I mean: it is not based on grounds. It is not reasonable (or unreasonable). It is there - like our life. *OC*, #559.
A language-game or a particular way of behaving, then, are not things we reason to. For instance, the manner in which we use our language does not come about as a result of consideration on our part. Wittgenstein states:

A language-game does not have its origin in consideration. Consideration is part of a language-game. \( Z, \#391. \)

Hence, that we draw inferences about the world the way in which we do—inductively—is something we do not reason to.

The point of the preceding observation is that we do not think inductively because we have good reasons to do so. The language-game of making inductive inferences might better be seen as just as much a "... part of our natural history as walking, eating, drinking, playing." It is, as Wittgenstein notes, not reasonable or unreasonable, but a form of life. The traditional philosophical problem of induction can be resolved, then, by noting Wittgenstein's observation that our inductive thinking, as a form of life, is in no need of justification.

On the basis of Wittgenstein's observation that inductive thinking is something that does not call for justification, I argue that it is a confusion on Popper's part to think that man's rationality is in danger because he cannot justify the manner in which he thinks. That is, man's inability to justify inductive inferences implies, for Popper, man's fundamental irrationality. We have seen,
though, that man's activity of making inductive inferences about the world is a form of behaviour that is not reasoned to and hence not based on grounds. That is to say that the issue at hand is not one of justification, and if Popper wants to make rationality dependent on being justified, neither is it an issue that puts man's rationality at stake. Rather, as Wittgenstein notes, it would seem to be a question of noting our game of making inductive inferences as a "proto-phenomenon." He writes:

The question is not one of explaining a language-game by means of our experiences, but of noting a language-game. PI, #655.

Popper's demand for a justification of our language-game of making inferences, for the purpose of justifying or explaining rational conduct on the part of man, is a demand, then, that is without grounds.

2. "This leads him to offer a prescription for rationality that is not credible"

The second part of the thesis statement holds that Popper's confusion over the concept of justification leads him to offer a prescription for rationality that is not credible. In what sense, it must be asked, does Popper's confusion lead him to offer us his conception of rationality, P₂? I will argue in what follows, that Popper can be seen to be unnecessarily attracted to a tempting feature of deductive logic "absolute" certainty.
The central feature of an inductive argument is the fact that its conclusion can be said, at best, to be probable. The true premises of a valid inductive argument only provide some grounds for the conclusion. Hence, an inductive conclusion only holds a "degree" of certainty. The central feature of a valid deductive argument is the fact that its conclusion from true premises can be said to be absolutely certain. In contrast to an inductive argument "... only a deductive argument involves the claim that its premises provide absolutely conclusive grounds."19

Popper's claim of man's fundamental irrationality, and his subsequent appeal to the deductive model of inference, can be seen to rest on the "uncertainty" of our inductive inferences. That an inductive inference can only be said to have a degree of certainty is to say, from a strictly logical point of view, that we can always hold a degree of doubt about a conclusion from such an inference. For Popper, the logical implication that we can always be in doubt about our inductive conclusions is a testament to the irrationality of inductive thinking. The fact that it is logically impossible to formulate a valid inductive principle and eradicate the doubt inherent in inductive thinking is precisely what Popper calls the logical problem of induction. That is, we are not jus-
tified in reasoning from instances of which we have experience to instances of which we have no experience (1:2), because we have no way of knowing with absolute certainty that the future will conform to the past. The deductive model of logic, with its central feature of absolute certainty is, according to Popper, the only alternative for a rational man.

Hence, that we can never know with absolute certainty that the past will conform to the future is, I maintain, the sense in which Popper is led to turn to the deductive model of inference and, as a result, offer his definition of rationality.

Is the ever-present uncertainty or doubt in inductive thinking a testament though, against that type of thinking? It would seem not. Wittgenstein writes:

The steps which are not brought into question are logical inferences. But the reason why they are not brought in question is not that they 'certainly correspond to the truth' - or something of the sort, - no, it is just this that is called 'thinking,' 'speaking,' 'inferring,' 'arguing.' There is not any question at all here of some correspondence between what is aid and reality; rather is logic antecedent to any such correspondence; in the same sense, that is, as that in which the establishment of a method of measurement is antecedent to the correctness or incorrectness of a statement of length. RFM, p. 45.

In the above passage, Wittgenstein points out that when we are engaged in the activities we call thinking, speaking, inferring and arguing, we do not call into question the logical inferences that may be a part of these
activities. It follows from this observation, then, that neither do we question the inherent qualities of the types of logical inferences we may use to think, for example. Hence, although we may admit there is the quality of logical uncertainty inherent in an inductive inference, it is normally of no consequence to the validity of an inductive judgement about the world. Our making inductive judgements about the world is, as Wittgenstein notes, just simply what we do (2:18-20).

Wittgenstein also points out, in the above passage, that logical inferences are not brought into question because it is not a problem of "some correspondence between what is said and reality; rather is logic antecedent to any such correspondence." The validity of an inductive inference does not depend on an empirical basis in reality, or in Wittgenstein's terms, "a correspondence between what is said and reality." Hence, Popper's claim that induction is a myth because an empirical justification for its truth is impossible (1:3) would seem to be unfounded.

Does the doubt or uncertainty inherent in inductive arguments, then, amount to a serious objection to our practice of making inductive inferences about the world? For instance, when the carpenter uses calculations and measurements to position a beam on a foundation wall, he may refer to these calculations and measurements for an
explanation or justification of the positioning of the beam. The carpenter may have occasion to give an explanation of his actions if, for example, his employer has some reservations about the particular positioning of the beam. There may have been, for various reasons a misunderstanding about the purpose of the beam. The misunderstanding might then be averted as a result of the carpenter's explanation. It has been argued, though, that there is a point at which both the carpenter's explanations and the employer's reservations would cease to make much sense (2:2-5, 10-11). This point might be reached, for example, if the carpenter is questioned about his reasons for thinking that because his calculations have proved successful in the past, they will do so in the future. It would not make much sense, it has been argued, for the carpenter to attempt this type of justification (2:11). Rather, it was seen that the carpenter assumes that his calculations will work (2:12). That is, he assumes that the past will conform to the future or he assumes the "principle of the uniformity of nature." His assumption is a rule or standard of thought that he learned as a child and that he utilizes when he practices his trade. How significant, then, is Popper's doubt about what he admits all reasonable people do: depend on the uniformity of nature (1:2)? Wittgenstein writes:

... an explanation may indeed rest on another one that has been given, but none stands in need of another
--unless we require it to prevent a misunderstanding—
one, that is, that would occur but for the explanation;
not everyone that I can imagine. It may easily look as
if every doubt merely revealed an existing gap in the
foundations; so that secure understanding is only pos-
sible if we first doubt everything that can be doubted,
and then remove all these doubts. The sign-post is in
order, under normal circumstances, if it fulfills its
purpose. PI, #87.

It is possible, we can grant Popper, to imagine the
doubt that the future may not conform to the past. This
doubt can be imagined, as I maintain Popper does, by noting
the logical impossibility of "absolute" certainty when an
inductive argument is appealed to. What we cannot grant
Popper, though, is that this imagined doubt "reveals an
existing gap in the foundations" of our language-game of
inductive inference. If, as Wittgenstein notes, the sign-
post fulfills its purpose there is no good reason for
doubting it. It is not, as Wittgenstein states, "... that we are in doubt because it is possible for us to
imagine a doubt." Indeed, when the carpenter assumes
that the past will conform to the future he acts with all
the certainty that he needs, for it is "... just that
kind of language-game." That we can imagine doubts
about our form of thinking does not bother us.

Wittgenstein writes:

... we don't need any grounds for [this] certainty
... What could justify the certainty better than
success? PI, #324.

'But, if you are certain, isn't it that you are shut-
ting your eyes in the face of doubt?' — They are shut.
PI, #224.
Hence, although we can admit that it is possible to imagine a doubt about whether or not the future will conform to the past, it does not seem that this doubt is one that should be taken seriously. This, of course, is not to say that surprises will not occur, that there will not be times when our expectations of the future will be met, but this does not cause us to give up our trust in the belief that nature is uniform (2:12-13). The principle of the uniformity of nature is a standard that we use to make inferences about the world, and, for Wittgenstein, these "inductive" inferences are justified by success, not logical certainty. This is to say that the doubt inherent in inductive logic is not significant enough for it to be a testament to the irrationality of using that type of logic.

It has been argued thus far that Popper is, first, confused about the concept of justification, and, second, that this confusion causes him to unnecessarily reject inductive logic as a type of logic that man, if he is to be truly rational, should appeal to. As a result of rejecting inductive logic, Popper makes an appeal to deductive logic to solve the traditional philosophical problem of induction. It has been shown, though, that from a Wittgensteinian point of view, his solution, $P_2$, is not credible because it is insufficient. The question remains,
though, precisely in what sense is the insufficiency of $P_2$ a criticism of Popper's conception of rationality? The purpose of the remainder of this chapter will be to answer the preceding question.

Popper, as noted earlier, does not deny that there are reasonable people. The problem that Popper attempts to solve is the clash, as he refers to it, between the expectations of reasonable people and the law of logic. That is, all reasonable people expect the future to conform to the past but there can be no justification for this expectation (1:2). The clash that Popper notes, then, amounts to the following. There are reasonable people but what is lacking is a justification or explanation for their rationality. For instance, Popper notes Russell's view that unless an answer can be found to Hume's realization that repetition has no power as an argument there is "no intellectual difference between sanity and insanity. The lunatic who believes that he is a poached egg is to be condemned solely on the ground that he is in a minority." (1:4).

Hence, Popper criticizes inductive thinking for its logical inability, seen by contrast to the deductive model of logic, to justify inferences with absolute certainty. That is, the man who makes inductive inferences about the world cannot give an explanation of why he as-
sumes the future will conform to the past; it is something, as we have seen, that he just does.

It would seem, though, that by following Popper's train of thought, neither can his \( P_2 \) amount to an adequate account of what it is to follow a rational course of action. A rational man, according to Popper, is one who can justify his preference for a theory or a course of action. His method of justification falls entirely within the scope of deductive logic (1:10). That is, a rational man, according to Popper, prefers a "test statement" whose falsity has not been entailed (1:5). According to \( P_2 \), the application of the deductive model of inference to life-like situations is determined by methodological principles. Hence, the rational course of action, for Popper, is determined by following the rules, or standards, of a critical methodology.

It was shown in chapter three, from a Wittgensteinian point of view, that this conception of rationality is insufficient. That is, a course of action cannot be guided solely by rules, for rules can be interpreted in various ways (3:18-19). To follow a rule correctly, Wittgenstein tells us, is a public affair (3:16). To say that to follow a rule is a public affair is to say that a practice or a custom is involved (3:21-22). That is, we are taught to share a technique which determines a rule's application.
(3:18-20). The manner in which a rule is applied, then, determines its meaning (3:24). Hence, according to Wittgenstein, a course of action can only be determined by rules if there exists a practice in which those rules can have meaning. It is in this sense that $P_2$, i.e., in the absence of any reference to a custom in which methodological rules can have meaning, is insufficient.

It was argued in chapter three that it would be unwise to define a course of action in terms of principles, because of the insufficiency of principles to account for or justify our actions (3:24). That is, rules by themselves cannot guide a course of action, and, hence it follows that they cannot entirely justify a course of action. Rules, Wittgenstein tells us, leave loop-holes open, and the practice must speak for itself (3:24). I argue, then, that Popper's conception of rationality, $P_2$, as it stands, is insufficient because it cannot fully justify or give a good explanation of what it is to follow a rational course of action.

Summary

For the purpose of defending the thesis of this paper, I have argued the following three points:

1) Popper wrongly perceives "our knowledge" (4:2) as of the nature of an irrational faith; or, Popper wrongly perceives man as being fundamentally irrational. That is,
because of his confusion over the concept of justification, Popper is led to think that the traditional philosophical problem of induction is a problem to be solved. Wittgenstein, though, shows us that the traditional philosophical problem of induction is a problem to be resolved. By noting Wittgenstein's observation, it was argued that our knowledge is in no danger of being unmasked as of the nature of an irrational faith.

ii) Popper's concern with a logical inadequacy of inductive arguments causes him to turn unnecessarily to the deductive model of inference. That is, because of the logical impossibility of formulating a valid inductive principle, or a justification that the future will conform to the past, Popper rejects inductive inferences as inferences that are rational. It was shown, though, that from a Wittgensteinian point of view, this logical inadequacy of inductive arguments is not significant enough to be a serious objection to our making inductive inferences about the world.

iii) Popper's conception of rationality is meant to overcome the inadequacy of inductive logic to justify or explain rationality, but $P_2$ is inadequate to the task. That is, Popper notes Russell's point that unless Hume's problem of induction is solved, there is no intellectual difference between a lunatic and a sane man. Although, by taking into account Wittgenstein's investigations into
the concept of a rule, it was shown that Popper's conception of rationality cannot fully explain what rationality is either.

I have argued, then, that Popper is confused about the concept of justification. I have also argued that his confusion causes him to offer a conception of rationality which does not, upon reflection, perform the task it is designed for: give an adequate account of rationality.
FOOTNOTES

Chapter IV


3 Wittgenstein, PI, #23.


5 Ibid.

6 Wittgenstein, PI, #25

7 Ibid., #654.


9 Ibid., p. 3.

10 Wittgenstein, PI, #84.

11 Ibid., p. 224.

97
POSTSCRIPT

Although it has been argued that Popper does not solve the "problem" that he sets out to, the question still remains: How far off track is he? For instance, it would not seem that he can be faulted for attempting to hold that rationality is closely connected to justification. This, aside from the traditional philosophical problem, can perhaps be seen as Popper's problem. That is, the search for a way in which reasonable men can justify their actions. The purpose of this postscript, then, will be an attempt to see if Popper's problem can be resolved.

Wittgenstein tells us that rules or principles are not enough to determine a course of action. That is, if one were to attempt an adequate explanation of what it is to be rational, perhaps it would be wise to realize that rules, although they may be a necessary condition, are not a sufficient condition for rational behaviour. Hence, an explanation of rationality would have to take into account both rules and the manner in which they are used.

A course of action is determined, then, by rules and the manner in which they are applied. The manner in which they are applied, Wittgenstein tells us, does not come into question. Practices or customs, in and of themselves, do not call for justification. They are forms of life. Given
this insight of Wittgenstein's it was argued that making inductive inferences is not a practice that puts man's rationality at stake (4:5). This is to say that practices are perhaps best seen as neutral, and, hence, cannot be seen as either rational or irrational. They just exist. If a practice, like science, is based on inductive inference, that is just simply what science does.

This is not to say, of course, that within the practice, the use of inductive inferences for particular purposes is outside the realm of justification. Members of a community may exhibit an agreement to use the model of inductive inference as the norm, but that is not to say there would be instances in which particular inductive inferences could not be predicated by the words rational or irrational. For example, we can imagine a carpenter placing a supporting beam in a position in which supporting beams are not usually placed. It would be easy to imagine his employer becoming curious and questioning the carpenter about his reasons for acting in such a manner. The carpenter might reply by telling his employer that the previous night he had built a house out of toothpicks, with a particular toothpick representing a supporting beam, and it seemed to work out quite well. The carpenter's employer, we would be inclined to think, would be in perfect right if he were to tell the carpenter that he is a fool to think that on the basis of this one
instance his experiment with the toothpick house warrants further application. It can be noted from this somewhat exaggerated example that both the carpenter and his employer are assuming the norm of inductive inference, but that the carpenter's particular use of this norm is somewhat questionable, perhaps irrational.

It can also be seen that there is no definite point at which we would want to say that the carpenter's use of the norm is either rational or irrational. If, in addition to performing the experiment with the toothpicks, the carpenter had made additional experiments, perhaps on other houses, his employer might be tempted to give him a chance at placing the supporting beam in a novel position, perhaps not. The employer may want more evidence to be produced before he thinks the idea a reasonable or rational one.

The point of the above story is to illustrate that within a practice there does not seem to be a rigid point at which we can absolutely say that a course of action is either rational or irrational. Indeed, only after we have accepted the norm (the practice of making inductive references) can we begin to get a clear idea of what is rational and what is not rational (from the particular uses of inductive inferences). The words rational and irrational receive their meaning within a language-game.
or practice.\footnote{\textit{footnote}}

We can agree with Popper, then, that a rational course of action is one that can be justified, but \textit{how much} justification is necessary – i.e., how many experiments the carpenter’s employer expects – is an open question. The amount of justification required in any particular situation may depend on numerous factors. For example, the carpenter’s employer may decide that he will take less experimental evidence than he usually does because he is in a rush, and the novel positioning of the beam will save him time, or he might decide to give the carpenter a chance to prove himself, etc. . . . That there is no definite line can be drawn does present a problem. \textit{But is it a philosophical problem?} It would seem not. That is, the factors that might enter into the employer’s mind would not be logical factors. Nowhere does the need for absolute certainty surface among the factors that the employer might consider to make his decision.

In conclusion, it would seem that Popper is on the right track in that he wants to associate rationality with justification, but he seems to be on the wrong track in that he thinks it is a philosophical matter. As Wittgenstein states:

The squirrel does not infer by induction that it is going to need stores next winter as well. And no more do we need a law of induction to justify our actions or our predictions. \textit{OC, #278.}
FOOTNOTES

Postscript

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103