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IS THERE ANY SUCH THING AS A SOCIAL OR BEHAVIOURAL SCIENCE?

A thesis presented in partial fulfilment  
of the requirements for the degree of  
Master of Arts in Philosophy at  
Massey University.

Michael Gordon Russell

1985

## ABSTRACT

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The type of explanation characteristic of science is causal, and it is natural to think that this type of explanation is appropriate for all events, no matter what their nature. It is this global assumption that is questioned in this thesis.

Chapter One presents a historical exposition of the development of causal explanation since the time of David Hume. The perennial theme has been the conceptual separability of causally related events and the need to insert an empirical law to deduce one from the other. Karl Popper (the subject of Chapter Two) has also used this deductive feature of causal explanation, and even argues for the unity of science, social and natural, on the strength of it. Throughout this tradition social behaviour is supposedly caused and requires the same kind of explanatory apparatus as any other behaviour.

The Wittgensteinian tradition (Chapter Three) opposes any such tradition by emphasizing the importance of normative rules governing human action, as opposed to any causal relations. In particular, the conceptual notion of a 'criterion of identity' is investigated in relation to both the natural and social sciences, and it is concluded that the logic of explanation works very differently in these two disciplines. This is so for two reasons. First, because the criteria of identity for any concept are logically, not contingently, related to that concept; and as the criteria for any action are the surrounding contexts, then those surrounding contexts cannot be the causes of the behaviour concerned in any Humean sense. Second, the criteria of identity are not imposed upon social phenomena from 'without', as is the case in the natural sciences; they are constituted from within,

and thus a social science must base the rules it uses upon the criteria belonging to the group being studied rather than the group of researchers studying it.

Social scientists cannot then give a causal explanation of human behaviour. But they can explain it by giving reasons; that is, by showing how the behaviour is conceptually related to the context by classifying it under the appropriate logical category. This point is emphasized in an investigation of the so-called 'Rationality Principle' in Chapter Four. Popper asserts that 'rational' behaviour is an 'appropriate' (causal) response to a particular problem situation; 'appropriate' being in accordance with the objective or brute facts. But the Wittgensteinian point remains however, i.e. that the problem which any agent is responding to is conceptually linked to that action and cannot therefore be the cause of it. Furthermore, rationality cannot be measured against any Popperian 'objective' or 'brute' facts; rather, rational behaviour is so according to certain human conventions, and these conventions are normative rather than objective in the Popperian sense. Rational behaviour is not then behaviour in accordance with the 'facts', but behaviour in accordance with relative normative criteria of rationality.

In conclusion, it is wholly inappropriate to explain human behaviour in terms of 'causes' and 'objective facts'.

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## INTRODUCTION

If asked to name that which most distinguishes twentieth century Western culture from all other cultures, most of us would draw attention to the achievements of science and technology. So useful and pervasive have they become in our everyday lives, and so drastically has science altered our world view by ridding us of superstitious and irrational beliefs, that we feel as if there is nothing that science could not, in principle at least, give a full account of. What concerns me in the following pages is one of the few remaining subjects that science has not yet been able to fully explain -- human behaviour.

Galileo began the process of diminishing the mysteriousness of human beings by making the sun the focus of the universe instead of *homo sapiens*. Darwin carried this reduction still further by making human beings a product of the inexorable laws of nature in just the same way as all other animals and plants -- ideas of a grand purpose or design in nature became intellectual nonsense. The last aspect of human beings to be explained is the mind. Is it just a causal mechanism like the human body? Or is it somehow different? There is much hanging on this question, especially when we are reminded that the concept of mind includes those features that make human beings unique -- they can, amongst other things, think, argue, calculate, plan, decide, understand, and engage in all manner of social activities. No animals or plants do such things, and thus it is just these sorts of activities that distinguish us from them. The problem remains of how such activities can be accounted for. Given the enormous successes that science has achieved, we feel confident that there should be no difference in principle between explaining the

regularities observed in human behaviour and those shown in the behaviour of planets, plants, and both the lower and higher animals. Given the time and technical expertise in the laboratory, it is often claimed, then in theory all that is required is persistence for the behaviour that makes human beings unique to be fully explained by science. Indeed, it is further claimed, it will in fact be the case.

It is this last claim that I wish to examine and question in this dissertation. This I do by comparing several different philosophical traditions. In the first chapter the concept of cause and causal explanation in both the natural and social sciences is examined by tracing its development and increasing sophistication through the empiricist philosophies of Hume, Mill, and Hempel. The type of explanatory account of human behaviour to be examined in Chapter Two is that given by the very influential philosopher of science, Karl Popper. He claims to have escaped the empiricist tradition and attempts to give a different basis for the explanation of human behaviour in light of his new philosophy of science and evolutionary epistemology. In Chapters Three and Four, the last tradition discussed is the new philosophy of Wittgenstein, Winch, and Searle, and the implications it has for the philosophies discussed in Chapters One and Two.

The whole of this dissertation takes, in effect, the form of a *reductio*. This can be best shown by the following schema.

- (1) Chapters One and Two consist of an investigation of the logical nature of causal explanation.
- (2) Chapters Three and Four show that the phenomena of human behaviour cannot meet these logical requirements.

(3) It follows, therefore, that human behaviour cannot be causally explained. This has the corollary, of course, that because scientific explanation is causal, then human behaviour cannot be a proper subject matter for scientific investigations.

After establishing these negative theses I try to show, with examples, how one actually should go about explaining human behaviour. This is done by using a type of explanation which is not of the same logical kind as that used in science, but is nonetheless perfectly respectable in its own right. Finally, in Chapter Five I attempt a diagnosis of why we have been so easily lured into mistakenly thinking that science is the only way to properly enlighten us, and an explanation of why we should instead regard science as just **one** of the activities that we do, there being others that are at least as important, and some more so in governing our everyday practices in life.

CHAPTER ONE

THE POSITIVIST TRADITION

## I. HUME THE INSTIGATOR

The classical exposition of how a causal explanation of human behaviour should go was given by Hume. He attempted to provide a method whereby human nature could be explained in the same way that Newton's mechanistic theory of the universe explained the movements of the planets. Human behaviour too is to be subsumed under causal laws of nature, the laws being established by the normal experimental methods of empirical science. There are two points that I wish to discuss in this section regarding Hume. Firstly, the empiricist limits which he imposed upon human knowledge, and secondly, his analysis of the very idea of cause. These two features of Hume's philosophy have remained influential in the philosophy of science to this day.

### The Limits of Knowledge

The very basis of any empiricist philosophy is that we cannot claim to possess knowledge of any matter of fact that is not ultimately based upon sense experience. Hume agreed with this traditional basis of empiricism but believed that the basic Lockean distinction between simple and complex ideas was inadequate for a thoroughgoing, uncompromising empiricist epistemology. As a basis for a true empirical epistemology he established a more sophisticated distinction between those same Lockean ideas and what he called 'impressions', such that a simple idea was always the result of a simple impression.<sup>1</sup>

[T]here is a considerable difference between the perceptions of the mind when a man feels the pain of excessive heat or the pleasure of moderate warmth, and when he afterwards recalls to his memory this sensation or anticipates it by his imagination. These faculties may mimic or copy the perceptions of the senses, but they never can entirely reach

the force and vivacity of the original sentiment.... [W]e may divide all the perceptions of the mind into two classes or species, which are distinguished by their different degrees of force and vivacity. The less forcible and lively are commonly denominated "thoughts" or "ideas". The other species want a name .... Let us ... call them "impressions" .... By the term "impression", then, I mean all our more lively perceptions, when we hear, or see, or feel, or love, or hate, or desire, or will. And impressions are distinguished from ideas, which are the less lively perceptions of which we are conscious when we reflect on any of those sensations or movements above mentioned.... [A]ll the materials of thinking are derived either from our outward or inward sentiment; the mixture and composition of these belongs alone to the mind and will ... [and] all our ideas or more feeble perceptions are copies of our impressions or more lively ones.

The usefulness of the distinction between ideas and impressions is that we can limit all knowledge of matters of fact to those ideas which can be traced back to impressions derived from experience. It is fundamental to Hume's empiricism that all knowledge of matters of fact is ultimately derived from sensory impressions, and thus it follows that we can never go beyond them when making claims to empirical knowledge; for example, I may have an idea that I am now perceiving a unicorn, but if I cannot trace that idea back to an impression, then the belief that I am now perceiving a unicorn is false. In this example the complex idea of a unicorn is to be explained as the result of the activity of the imagination in compounding simple ideas that do indeed result from impressions but in an illegitimate way. By making the distinction between ideas and impressions, the latter being distinguished by their greater vivacity, Hume has removed any validity in going beyond experience when making existential claims such as Locke's 'something-we-know-not-what' lying behind and supporting objects, or Berkeley's 'God' that supposedly underlies and causes our sense impressions. If we doubt the truth of any conceived idea, then we need only seek the

impression from which it supposedly derives to be clear as to its truth or falsity.

The only other type of knowledge that we can possibly have is that contained in the relations of ideas. Statements describing such relations -- and among these are the theorems contained in mathematics and logic -- say nothing significant about the empirical world at all because they consist of mere tautologies, and are true or false regardless of how the world goes. The truth of these statements, unlike the truth of empirical statements, is known prior to experience because they are demonstrable by thought alone. It is a logical contradiction to deny any statement that affirms a true relation of ideas, whereas there is no contradiction or absurdity involved in imagining the opposite of any contingent matter of fact.

The two types of knowledge I have briefly discussed -- relations of ideas and matters of fact -- are exclusive and exhaustive. Claims to any other types of knowledge are deemed to be beyond the proper limits of human knowledge and are thus rejected.

### The Empirical Analysis of Causation

Hume applied this destructive dichotomy to many traditional philosophical assumptions, most famously to the investigation of the concept of cause. Previous to Hume, it was assumed a necessary ontological relation existed between an event and its cause, i.e. that there must necessarily be some cause A for a given event B. Furthermore, it was also supposed (and still is to some extent) that this relation consisted of some sort of force, power, or shove provided by the cause A needed to bring

the event B into existence; in other words, there was some sort of underlying occult mechanism at work. It was these unquestioned assumptions concerning the nature of causal relations that Hume wished to examine. From where was this idea of a necessary connection derived? Using his two sources of knowledge, Hume applied the appropriate tests to answer this question. Is it possible to imagine the opposite of an established causal relation? That is, if A's had always been observed to be the cause of B's, is it then a logical contradiction to imagine or assert an A causing something other than a B? or conversely, something other than an A causing a B? It is Hume's answer that there is no such logical contradiction involved. The idea of a necessary connection cannot, therefore, come from the 'relations of ideas' type of knowledge. The only other possible alternative is that the idea of a necessary causal connection is derived from the 'matter of fact' mode of knowledge, i.e. from sensory impressions. But, to quote Hume's famous example, we never do have any such impression.<sup>2</sup>

When we look about us toward external objects and consider the operation of causes, we are never able, in a single instance, to discover any power or necessary connection, any quality which binds the effect to the cause and renders the one an infallible consequence of the other. We only find that the one does actually in fact follow the other. The impulse of one billiard ball is attended with motion in the second. This is the whole that appears to the *outward* senses. The mind feels no sentiment or *inward* impression from this succession of objects; consequently, there is not, in any singular particular instance of cause and effect, anything which can suggest the idea of power or necessary connection.

All that we ever perceive then, is a sequence of events that are contiguous in space and time. Furthermore, we have also observed that if the first event is repeated in like circumstances, then

we perceive the same sequence of events following the first event as we did on the original occasion. That is, causes and their effects have been observed to be constantly conjoined. Generally speaking, we see A's regularly followed by B's and have never seen a B not preceded by an A. Nowhere in the causal sequence of events, however, have we ever experienced an impression of a 'force', 'power', or 'necessary connection'. Causation is constant conjunction, not push and shove.

Given that we are restricted to impressions, and that the idea of a 'power' or 'logical necessity' (Hume often uses these terms as if they are synonymous) does not come to us via those sense impressions, where then does it come from? Hume's solution to the problem is that this belief comes about as the result of a habit or disposition of the mind. Given that I have observed a constant conjunction of A's and B's in the past, and also that I am now observing an A, then my mind leads me to anticipate an idea of a B, and this is accompanied by a strong feeling that that's how things **must** be related in the objective world. The result of this strong feeling is that I **impose** a necessary connection upon the objective world which I have no right to.

It is tempting at first sight to accuse Hume of implicitly using such concepts as 'power' and 'force' when giving a causal account of the mechanics of the mind in producing the idea B as a result of having the idea A. Hume is not so easily caught out however, because a habit or propensity can itself be explained in terms of constant conjunctions. To explain why we have such a habit provides us with a splendid example of how to give a causal explanation of human behaviour. The following schema will facilitate the clarification of this point.

CAUSES: (C1) I have previously experienced a constant conjunction of A's and B's, and (C2) I have just experienced an A.

EFFECTS: (E) I now have the idea of a B.

Nowhere here is there any need to invoke a power or force, all that is required is to give various descriptions of conjoined events. Thus we have a constant conjunction of (1) past observations of constant conjunctions of A's and B's by a human mind (C1), conjoined with (2) anticipations of a B (E) upon having an idea of A (C1). That is, the constant conjunctions contained in each of (1) and (2) are themselves constantly conjoined, and accounting for the anticipation on the basis of past observations just is to explain the 'causal mechanism'. We have, then, a new 'law of human nature' to the effect that human beings regularly anticipate events given the appropriate previous experiences. This is just one example of how Hume gives a causal explanation of human behaviour. (To avoid possible confusion note that when Hume uses any causal word to explain some phenomena, it must always be interpreted in terms of constant conjunction; thus the words 'habit', 'produces', 'origins of', 'springs from', 'pushes', 'knocks', 'breaks', 'mechanism', 'disposition', 'propensity', 'makes', 'forces', 'determines', 'influences', 'power', 'efficacy', and 'tendency' should not be read as referring to an underlying mechanism when Hume uses them.)

It is evident from this analysis that necessity is not to be found in nature but in human minds -- necessary connections or pushes or pulls are not to be found 'out there' in nature waiting

to be discovered, rather, they are what we impose upon nature due to the determination, i.e. the habits, propensities, or dispositions of our minds. From this analysis it appears that Hume provides us with two definitions of cause.<sup>3</sup>

(1) The Philosophical Definition

*[W]e may define a cause to be an object followed by another, and where all the objects, similar to the first, are followed by objects similar to the second. Or, in other words, where, if the first object had not been, the second never had existed.*

(2) The Natural Definition

The appearance of a cause always conveys the mind, by a customary transition, to the idea of the effect. Of this also we have experience. We may, therefore, suitably to this experience, form another definition of cause and call it *an object followed by another, and whose appearance always conveys the thought to that other.*

The philosophical definition of cause describes the objective, contingent, and separate relations that hold between the distinct things we designate as causes and effects. These relations exist even if there are no minds to perceive them. The natural definition of cause is a causal explanation of how the thought of one event leads to the thought of another according to the laws of the association of ideas. The latter is of course dependent upon minds, and able to be fully explained within the limitations of the philosophical definition of cause given above, that is, in terms of constant conjunctions.

What is of real importance for all that follows in this dissertation, is not the differences in objects' constant conjunctions and our thoughts' constant conjunctions, but the simple fact that any causal relation between entities is not one of a power or a logical necessity. Events and their causes are

sensed regularities of logically distinct events -- **fullstop!**

According to Hume's account, scientific knowledge, which consists of causal explanations, is restricted to *de facto* regularities of classes of events that we must have experienced, they can never be known *a priori*. From these perceived regularities we can make hypotheses as to the all-important general laws of nature, which are important because they enable us to explain, predict, and control nature for our own purposes. But we must be careful never to infer from observed regularities that these laws supposedly describe underlying mechanisms that push or pull things into existence. Hume insists, as Newton did, that we must forever remain agnostic as to what, if anything, goes on beyond our impressions; for that is not a proper subject of human knowledge. It must be added, however, that Hume is not denying that anything does in fact go on behind phenomena, for on the contrary, he affirms that these secret powers are the ultimate source of all the workings of nature, but what he is denying is that they can ever form part of our knowledge.

This picture of science as the active searching for causes of classes of events has exerted a major influence on the development of science ever since. Hume does not restrict the search for causal explanations to physical science alone, for it can also be taken quite readily over to the scientific study of human behaviour also. This results from the assumption that **any** phenomenon that exhibits regularities is causal in nature and is thus a proper subject for science to investigate. The task of the social scientist is to give a causal account of the regularities displayed in human behaviour in just the same way as the natural scientist does for natural phenomena; that is, by the

tracing of constant conjunctions (the natural definition of cause given above is an example of this). Due to his scepticism (i.e. many of our beliefs are not based upon reason or experience and are therefore 'nothing but sophistry and illusion') Hume seeks a causal explanation for human beings coming to hold metaphysical beliefs -- such as the Principle of the Uniformity of Nature, the existence of an external world, the existence of God, and the existence of the self -- in terms of natural human habits and dispositions. Once he has examined the reasons traditionally offered for such beliefs and found they are unacceptable in light of his empiricist principles, he then searches for the natural causes of these beliefs by way of his 'attempt to introduce the experimental method of reasoning into moral subjects'.

To explain human behaviour in this way makes human beings part of nature, and the normal experimental techniques of natural science apply in the same way here as they do for any other subject matter. A word or two must be said about these techniques, which include the heuristic Principle of the Uniformity of Nature, the laws of probability, and the methods of agreement and difference. At the beginning of the Treatise Hume declared his intention to show how the methods of science must be confined to the limits of human understanding, and thus to rid science of metaphysics. His scepticism is ruthless in this respect, but he does not leave science without any foundations at all. Rather, those foundations are now based upon different principles; before they were claimed to be great metaphysical principles known *a priori*, now they are confined to the limits of human nature, i.e. the laws of the association of ideas.

Metaphysical beliefs such as the Uniformity of Nature, the necessity of causal connections, and the reality of the external world, are all without foundation, we have no right to make such claims. But this does not mean that we must sink into *Pyrrhonic* scepticism.<sup>4</sup>

[A] *Pyrrhonian* cannot expect that his philosophy will have any constant influence on the mind or, if it had, that its influence would be beneficial to society. On the contrary, he must acknowledge, if he will acknowledge anything, that all human life must perish were his principles universally and steadily to prevail. All discourse, all action would immediately cease, and men remain in total lethargy till the necessities of nature, unsatisfied, put an end to their miserable existence. It is true, so fatal an event is very little to be dreaded. Nature is always too strong for principle.

Human nature as described by the laws of the association of ideas is then too strong to give in to such scepticism -- the beliefs we have concerning the uniformity of nature and the reality of the external world are necessary for our continued survival, and it is completely rational to act by them as a **heuristic** principle until such time as experience shows them to be inadequate. Science takes these principles and develops them further by being more disciplined -- hence the methods of agreement and difference in searching for elusive causes (Hume anticipated Mill in these methods, but neglected to give a detailed account of them<sup>5</sup>). As a heuristic principle only we are quite justified in using the Principle of the Uniformity of Nature, for 'none but a fool or a madman will ever pretend to dispute the authority of experience or to reject that great guide of human life',<sup>6</sup> but we can never claim to possess *a priori* knowledge that it will hold universally.

Hume argues for the causal nature of human behaviour by

drawing our attention to that which we all know from our own personal experience, i.e. the constant conjunction of our acts of will and our bodily movements. We all know in our own case that our private passions are the causes of our public behaviour. Furthermore, as like events have like causes (the heuristic principle) then it follows that a piece of public behaviour of yours that is similar to mine has the same inner cause for you as it does for me. The same argument applies to everyone else's public behaviour. To support this conclusion, Hume offers a somewhat glossed over argument from analogy to other minds.<sup>7</sup> But a much clearer and more persuasive form of the argument from analogy is contained in his attempt to prove that animals are enminded beings in just the same way as human beings are.<sup>5</sup>

When ... we see other creatures, in millions of instances, perform like actions, and direct them to like ends, all our principles of reason and probability carry us with an invisible force to believe the existence of a like cause. ... 'Tis from the resemblance of the external actions of animals to those we ourselves perform, that we judge their internal likewise to resemble ours; and the same principle of reasoning, carry'd one step farther, will make us conclude that since our internal actions resemble each other, the causes, from which they are deriv'd, must also be resembling. When any hypothesis, therefore, is advanc'd to explain a mental operation, which is common to men and beasts, we must apply the same hypothesis to both ...

We as human beings cannot help but take note of the regularities around us in both the natural and the human worlds. Indeed the existence of a community of human beings at all presupposes an ability on the part of its members to be capable of recognizing and predicting human behaviour, and that in turn relies upon a knowledge and anticipation of constant conjunctions of mental events and actions. The social scientist merely takes this everyday ability to perceive regularities further by actively

seeking out the causes of the more obscure and subtle forms of human behaviour.

Hume readily concedes the point that social scientists study a subject matter which presents many more difficulties than does that of the natural scientists. But this is only because human behaviour is a much more complex phenomenon than others due to the enormous diversity of character differences displayed by individuals and nations. This diversity is in turn explained by the different environmental causal factors working upon the minds of individuals. In the physical world too there are extremely complex phenomena which, like human behaviour, are not yet fully explained due to our imperfect knowledge of all the relevant causal factors. Accurate weather forecasting, for instance, would be possible if we had knowledge of all the relevant causes. At present, however, we must be satisfied with probabilities only. All that is required for these difficult cases is perseverance and hard work, for in principle, even if not in practice, we can give a causal account of any phenomenon that displays regularities by finding that with which it is constantly conjoined. The important point to note is that even though human behaviour is more complex than physical phenomena, it is still the same in kind.

Before concluding this section on Hume, I shall give short examples of how Hume himself uses these principles in two fields of social inquiry; namely, the studies of history and religion.

### Hume's Account of Historical Method

[T]he most usual species of connection among the different events which enter into any narrative composition is that of

cause and effect; while the historian traces the series of actions according to their natural order, remounts to their secret springs and principles, and delineates their most remote consequences. He chooses for his subject a certain portion of that great chain of events which compose the history of mankind: each link in this chain he endeavors to touch in his narration; sometimes unavoidable ignorance renders all his attempts fruitless; sometimes he supplies by conjecture what is wanting in knowledge .... He sees that the knowledge of causes is not only the most satisfactory ... but also the most instructive; since it is by this knowledge alone we are enabled to control events and govern futurity.

The first point to note<sup>9</sup> is that the historian's task is to trace a series of actions through a period of time, each one being the cause of the next (keeping in mind, of course, that words such as 'springs' must be interpreted in light of constant conjunctions). This is achieved by the methodological principle that the laws of human nature remain constant throughout time and culture,<sup>10</sup> without such a principle the study of history would not be possible. By applying such a hypothesis we can fill in the gaps of a series of historical events that result from insufficient or dubious evidence. Note again that what the historian is postulating, the 'gap filler', is a hypothesis only, and can never have the same status as an established fact. This because it is impossible to trace the idea of a hypothesis of some historical event back to an impression for the obvious reason that we cannot experience an event that has already happened. Thus we can never be certain what has happened in the past and must remain content with hypotheses only.

### Hume's Naturalistic Account of Religion

Hume's study of religion exploits his historical method, but in addition he uses methods which anticipate both the psychology and the anthropology of religion that we have now made into

distinct disciplines. He argues that religion emerges from the passions of mankind, not from the revelation of any metaphysical truth -- what possible impression could count as the originator (and hence the validator) of such a claim? This approach explains the use of the word 'natural' in the title of his book The Natural History of Religion, for in studying religion as a natural rather than a supernatural phenomenon, we are restricted to the methods of the natural sciences. His (supposedly) detached method of the scientific study of religion consisted of the gathering of relevant data from returning travellers and picking out any significant patterns that might give a clue as to its natural origins. He arrived at many conclusions, but only one still seems to have adherents in this age, and that is his hypothesis that the universal passion of mankind with which the phenomenon of religion is constantly conjoined is fear. Conjoined with all of mankind's religions is the insecurity of human beings in the face of life's contingencies; that for Hume is the temporal antecedent, and thus the cause, of religion in primitive man.<sup>11</sup>

No passions ... can be supposed to work upon such barbarians, but the ordinary affections of human life; the anxious concern for happiness, the dread of future misery, the terror of death, the thirst of revenge, the appetite for food and other necessaries. Agitated by hopes and fears of this nature ... men scrutinize, with a trembling curiosity, the course of future causes, and examine the various and contrary events of human life. And in this disordered scene, with eyes still more disordered and astonished, they see the first obscure traces of divinity. [T]hese *unknown causes* ... become the constant object of our hope and fear; and while the passions are kept in perpetual alarm by an anxious expectation of the events, the imagination is equally employed in forming ideas of those powers, on which we have so entire a dependence.

Hume is claiming here that the origin of religion -- and by

that, remember, he does not mean any underlying mechanism that 'forces' the phenomena of religion into being, but merely the impressions we habitually associate with it -- lies in the combination of: (1) primitive man living in fear of the contingencies in life, (2) his ignorance of the real causes of those contingencies, and (3) his imagination. This combination led primitive man to postulate mysterious metaphysical 'powers' in much the same way as Locke and Berkeley did, instead of seeking the discernible class of events with which each of these contingencies was constantly conjoined. Even if these primitive peoples did have the Humean notion of cause, they would not have had the experimental sophistication to discern the specific class of observables with which they were constantly conjoined. Thus the combination of (1), (2) and (3) led to the postulation of divine causes and the subsequent need to keep these 'gods' happy by worship and ritual. If these primitive people only knew the real causes of these contingencies in life, they would not have needed to postulate such metaphysical divine causes. It is of no real consequence whether Hume is correct in his conclusions here or not. What is important is his method of attempting to give an account of human behaviour in causal terms; in this case the passions of the mind are the determining factors. This method of explanation has been central to the philosophy of social science ever since.

## II. MILL'S POSITIVISM

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Mill's philosophy was similar to Hume's empiricism in some important respects, such as denying that any matters of fact can be known prior to experience and reasserting the distinction that Hume made between impressions and ideas. But the most important similarity between Mill and Hume lies in their common aim: they were each occupied in providing an empirical basis for the sciences, both natural and social, in which explanations consisted of descriptions of constant conjunctions. Mill's empiricism, however, was much richer in detail than Hume's, and by refining an eclectic combination of British empiricism and French positivism, he left as his legacy, amongst other things, his famous System of Logic. In this eminently readable and detailed work he gives an account of what is involved in the 'ratiocinative and inductive' reasoning used in all scientific investigations.

According to Mill there are two parts to any scientific explanation: (1) making hypotheses, and (2) testing these hypotheses via the deductive method. It will be profitable to consider these methods before proceeding to what he has to say in Book Six of his Logic where he deals with 'the Logic of the Moral Sciences'.

### The Hypothesizing of Natural Laws

Mill took very seriously Hume's conceptual distinction between causally related events. To give an explanation a scientist must establish the cause of the event in question, and that means a search for the antecedent with which it is invariably conjoined. This is not always so easily achieved as

one might think. For instance, the antecedent circumstances of an event may include a number of factors, but not all are causes, some being incidental concomitants only. Another complexity arises when it is noted that there may be an indefinite and hence unknown number of component causes which when combined are followed by the one effect. These two points alone are sufficient to show that we cannot tell by mere observation the individual causes of an event unless it is a very straightforward case. There are two ways, Mill suggests, that the causes can be established; (i) by experimentation, and (ii) by deduction.

(i) Experimentation. The two main methods of experimentation are the first two of Mill's famous 'Canons'. The first is the method of agreement.<sup>12</sup>

If two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstance in which alone all the instances agree, is the cause (or effect) of the given phenomenon.

That is, suppose the antecedent circumstances of the event X were recorded on two different occasions.

<u>Occasion</u>	<u>Antecedents</u>	<u>Consequent</u>
1	ABC	X
2	ADE	X

We would conclude from this that the probable cause of X was A.<sup>13</sup>

For example, let the effect a be crystallization. We compare instances in which bodies are known to assume crystalline structure, but which have no other point of agreement; and we find them to have one, and as far as we can observe, only one, antecedent in common: the deposition of solid matter from a liquid state .... We conclude, therefore, that the solidification of a substance from a liquid state is an invariable antecedent of its crystallization.

The method of agreement is open to the criticism that there may be many component causes which are compounded in some way to give the one effect. In the table above, for example, X may be the effect of the joint partial causes  $A_1, A_2, \dots, A_n$ , in which case we can never establish from the method of agreement the nature of the individual causes. Mill acknowledges the validity of this criticism and adds the qualification that we must take as many of the antecedent factors we can into account when using this technique, that is, by trying to reproduce an A together with as wide a variety of different antecedent circumstances as possible to establish whether an X follows. But it is not always possible, as we shall see below in the science of sociology, to manipulate the circumstances in this way when studying social phenomena.

The second of Mill's Canons is the method of difference.<sup>14</sup>

If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring only in the former; the circumstance in which alone the two instances differ, is the effect, or the cause, or an indispensable part of the cause, of the phenomenon.

The table is as follows.

<u>Occasion</u>	<u>Antecedents</u>	<u>Consequent</u>
1	ABC	X
2	BC	-X

It is evident that the cause of X is A, for if A occurs, then X follows, and if A does not occur, then neither does X; i.e. they are **invariably** conjoined (note that this is included in Hume's philosophical definition of cause). Mill maintained that the method of difference was the most important of his inductive

methods. It is a very powerful laboratory technique for verifying a hypothetical cause, for all we need do is exclude the hypothetical cause from the same set of antecedent circumstances to observe whether the effect X occurs. In particular, the method is effective for distinguishing between accidental and causal sequences (i.e. between merely occasional and really constant conjunctions). For example, two pendulums placed next to each other may be swinging at the same rate with one pendulum slightly ahead of the other. It is apparent that there is a conjunction of events between the two, but we would not wish to assert that one was the cause of the other. All we need do in this situation is stop the first pendulum to prove that it is not the cause of the other's movements, for if it were the second pendulum would also stop. Generally speaking, a constant conjunction is causal if and only if the consequent event would not have occurred had the antecedent event not.

(ii) **The Deductive Method.** There are many complex phenomena for which Mill's methods of experimentation (more properly 'experimental induction') will not work, and this is especially so in those types of phenomena mentioned briefly above which are the single effect of multiple causes. An example of this is the sum of two or more forces which, when added together, result in a net force quite different in magnitude and direction from its component parts; it even being possible for a state of equilibrium to be reached in the cases where the component forces serve to cancel each other out. It is impossible, using the ordinary techniques of experimentation, i.e. Mill's Canons, to establish the individual component causes of such an effect. This is because an indefinite and hence unknown number of component

~~causes are combined in an unknown way to produce the given~~  
effect. Indeed, there are many possible combinations that may produce that particular effect, and we cannot tell by experimentation alone which combination is the correct one. To overcome this problem Mill suggests using the deductive method in which laws that have already been established by the methods of experimentation are compounded in such a way that the effect can in principle be deduced from them. If it cannot be so deduced then that is proof positive there is a mistake contained in either the premises or the deduction.

The method of deduction, however, is more far-reaching than just this back-tracking for errors. Indeed, it is this feature of Mill's philosophy of science that he is best known for, and it is still central to scientific explanation today. When Hume made an event and its cause conceptually distinct, the only way left to logically deduce one from the other was to insert a suitable middle premise so that the event could be deduced from its causes. These middle premises are the natural laws established by Mill's experimental methods. A most important corollary emerges directly: **all scientific explanation, i.e. all causal explanation, is deductive.** For an event to be explained it must be deducible from two sets of premises: the first set describes the antecedent events, and the second set describes the relevant natural laws connecting the described causes and effects (i.e. they state generally the relevant constant conjunction in the form 'all A's are B's'). If we cannot deduce an event from premises consisting of antecedent events and general laws, then we must go back to the laboratory and check our experimental techniques and deductions again, for no natural event is an

~~exception to this type of explanation.~~

This logical feature of scientific explanation is extremely useful in enabling us to test our middle premises; indeed, to even possess the lofty status of general laws they must be tested. The testing of hypotheses takes place according to the following three-step schema.

- (1) The formulation or hypothesizing of the general laws of nature by the rules of experimentation known as 'Mill's Canons'.
- (2) From these hypothetical laws, together with a set of antecedent conditions, statements of purported fact are deduced by the rules of logic.
- (3) The derived statements of purported fact must now be tested by observing whether they fit the actual facts; the fate of any hypothesis is decided upon by this criterion alone.

To emphasize the deductive nature of science, Mill makes an important distinction between universal natural laws, which have been discussed above, and empirical laws. The latter consist of the correlations that we can make of observed regularities in the complex phenomena immediately around us. As a consequence they can only apply within the spatio-temporal vicinity from which they were originally derived -- a certain geographical location, a particular altitude, or climate; Kepler's Laws are specific instances of empirical laws because their application is limited to the planetary motions of this solar system only. Empirical laws then, no matter how useful they are, should not be thought to have the universal application the basic natural laws have. Rather, it must be shown how these (parochial) empirical laws are derived from the (universal) laws of nature; that is, they must be seen as a complex instance of a combination of the more general underlying laws of nature. There are two methods of

explaining these empirical laws, the most simple of which can be demonstrated directly by the schema above, i.e. we derive the consequent (in this case the empirical law) from the premises describing the relevant antecedent environmental conditions and the universal laws and then test it against the facts. The second method (already hinted at above in the problems concerning the composition of multiple causes) is more complicated because it works in the opposite direction to the method just given. The empirical law is first correlated and hypotheses are made as to the universal laws of nature from which these empirical laws can be derived given the relevant antecedent conditions. In turn these hypotheses are tested by deducing from them statements of fact different to those that they were initially inferred from, and then checking that these further deduced statements do indeed fit the objective facts (the deductive schema in action once again).<sup>15</sup> The deductive method is then invaluable for not only explaining classes of events by subsuming them under natural laws, but for explaining the less general parochial laws as well (Kepler's Laws being explained by Newton's General Law of Gravitation is an instance of this). Note also that empirical laws, like singular events, depend upon the relevant antecedent circumstances.

### Social Science

In Book Six of his Logic Mill attempts to provide the causal basis upon which the social sciences can be made respectable and dragged out of their 'backward state'. **Any** science, to be a science at all, must obey the experimental and deductive rules discussed above; thus both the physical and the social sciences

~~must exploit the same patterns of inductive and deductive~~  
reasoning.

Mill also takes the view that all explanations of social phenomena must be ultimately reducible to the laws of associationist psychology. Following Hume, the associationists claimed that we can derive the associative laws governing the activities of the mind through introspecting the constant conjunctions of our ideas. These laws, of which there are few, describe coherent clusters and sequences of ideas from which we derive the complex ideas of objects and causal relations. The associative laws of mind are, furthermore, the causal antecedents of all intentional human behaviour -- all our perceptions, beliefs, knowledge, and aims which our actions invariably follow, are subsumed under these laws of human nature. A most important point follows directly, i.e. because these universal laws of human nature govern the behaviour of each and every individual, then individuals are the atoms of society. All social facts then, are reducible to the actions of individuals, and these in turn are reducible to the laws contained in associationist psychology -- there are no irreducible social facts, there are only deductions from the general laws of human nature. To substantiate this claim, Mill must offer an argument to the effect that these laws of human nature are indeed universal (i.e. 'laws of nature' are not merely 'empirical laws'), and this he does by offering just about the best argument from analogy there is.<sup>16</sup>

I conclude that other human beings have feelings like me, because, first, they have bodies like me, which I know, in my own case, to be the antecedent condition of feelings; and because, secondly, they exhibit the acts, and other outward

signs, which in my own case I know by experience to be caused by feelings. I am conscious in myself of a series of facts connected by an uniform sequence, of which the beginning is modifications of my body, the middle is feelings, the end is outward demeanour. In the case of other human beings I have the evidence of my senses for the first and last links of the series, but not for the intermediate link. I find, however, that the sequence between the first and last is as regular and constant in those other cases as it is in mine. In my own case I know that the first link produces the last through the intermediate link, and could not produce it without. Experience, therefore, obliges me to conclude that there must be an intermediate link; which must either be the same in others as in myself, or a different one: I must either believe them to be alive, or to be automatons: and by believing them to be alive, that is, by supposing the link to be of the same nature as in the case of which I have experience, and which is in all other respects similar, I bring other human beings, as phenomena, under the same generalizations which I know by experience to be the true theory of my own existence. And in doing so I conform to the legitimate rules of experimental enquiry. The process is exactly parallel to that by which Newton proved that the force which keeps the planets in their orbits is identical with that by which an apple falls to the ground.

In asserting what is commonly known as 'methodological individualism', Mill is deliberately setting himself against the 'Chemical Method' of social science whereby the collection of individuals is primary and the metaphysical status of the individual changes depending on whether he is considered as an individual existing alone or as an individual belonging to an organic whole. According to the chemical method, then, the individual and the whole are in some deep sense **qualitatively** different, and not merely quantitatively. This Mill flatly rejects:<sup>17</sup>

The laws of the phenomena of society are ... nothing but the laws of the actions and passions of human beings united together in the social state. Men, however, in a state of society, are still men; their actions and passions are obedient to the laws of individual human nature. Men are not, when brought together, converted into another kind of substance, with different properties; as hydrogen and oxygen are different from water, or as hydrogen, oxygen, carbon, and azote, are different from nerves, muscles, and tendons.

Human beings in society have no properties but those which are derived from, and may be resolved into, the laws of the nature of individual man.

The methodological individualism espoused in these few lines is taken up again by Popper in the twentieth century (to be discussed in Chapter Two). Consider now some of the details of Mill's claims.

It is Mill's intention to explain social facts by reducing them to the ultimate laws of human nature. He does this by establishing three different disciplines; psychology, ethology, and sociology. (In the twentieth century these terms would all come under the umbrella of the 'social sciences', but Mill is using these terms in a way slightly different to their modern application, especially, as will soon become apparent, the latter term.) Psychology encompasses the general laws of human nature, ethology the general laws of individual or national character, and sociology the empirical laws of social phenomena (remember the logical differences between natural and empirical laws; the former are universal, the latter are statistical correlations having a limited regional application only). These respective disciplines each study an area of human behaviour which encompass laws of decreasing generality, ranging from the universal to the parochial. The methods of each discipline and the relations between them are analogous to, say, the methods of and the logical relations between physics, chemistry, and biology -- that is, the less general empirical laws are causally explained by deducing them from the more general universal laws.

Mill firstly argues for a distinction but also a relation between (1) the basic universal laws of human nature derived by introspection, and (2) the empirical laws of social science

derived from correlations of observed regularities in particular societies. Some Continental philosophers of history have mistakenly used these parochial empirical laws as if they had universal application, and postulated them as the underlying universal laws of history by which we can explain and predict all stages of human development. Whilst they met with a certain degree of success in their predictions, their theory is, according to Mill, false. To properly explain the complex phenomena observed in society (the empirical laws of social science), we must be able to show that they are deducible from the laws of human nature -- and this is something the Continental philosophers had neglected to do. What is required for such a demonstration is a set of middle premises; namely, the laws contained in the branch of science known as ethology. These laws confirm merely that character differences observed between individuals are not different because **human nature** changes from person to person, or nation to nation, but because the variable environmental **circumstances** in which the unchanging laws of human nature operate change according to time and place for individuals and nations (note the anticipation of the twentieth century behavioural sciences here). The environmental circumstances include not only the relevant physical circumstances -- climate and geography -- but the social or historical situation as well -- the type of government, religion, education, and morals. The hypothetical laws contained in the science of ethology result from the combination of (1) the known laws of mind (the universal 'laws of human nature') and (2) the universal laws governing the effects of the external circumstances upon those laws of human nature. It follows from this that the laws of ethology too are

universal, and take the form 'whenever human beings are in circumstances X (e.g. exposed to continual undue criticism), they will have the personality characteristic Y (e.g. lacking in confidence)'. That is, the circumstances X act on the laws of human nature to produce the personality characteristic Y.<sup>18</sup>

The laws of the formation of character are, in short, derivative laws, resulting from the general laws of mind; and are to be obtained by deducing them from those general laws; by supposing any given set of circumstances, and then considering what, according to the laws of mind, will be the influence of those circumstances on the formation of character.

This can be represented more clearly by the following schema.

**MAJOR**            The most general laws of human nature contained in  
**PREMISES:**        associationist psychology.

**MIDDLE**           The laws of ethology deduced from both the laws of  
**PREMISES:**        association and the laws governing the relevant  
                          social and environmental factors.

**DEDUCTION:**     The empirical laws derived by drawing correlations in  
                          social behaviour, i.e. the subject matter of  
                          sociology. (see page 34 below for an example of  
                          this).

Provided that the empirical laws derived from observations can be causally deduced from the laws of ethology, which in turn are causally dependent upon both the universal laws of mind and the laws governing the relevant environmental factors, then the correlations contained in the empirical laws are said to be explained. The explanation of social phenomena is a matter of the most general laws of human nature being tied to a historical and geographical setting through the universal laws of ethology. In decreasing order of generality then, we have the laws of psychology, ethology, and sociology.

As the **effects** of the laws of ethology are relative to time

and place (and not, it should be noted, the laws of ethology themselves), then it is not possible to predict in advance all the changes that will occur in human progress -- but this is exactly what the Continental philosophers of history had attempted by using empirical laws derived from statistical correlations. All that is possible from empirical laws is the deduction of parochial tendencies, not the deduction of universal laws of history -- indeed, there are none. We can use knowledge of these tendencies for the purposes of prediction provided that they are used **only** in the situations from which they were derived, beyond that they are inappropriate (a point that Popper made yet again in his Poverty of Historicism).

Mill also criticises another theory, the 'geometrical method', for its wrong-headed account of causal laws. The theory was supported by the Benthamites who assumed that all social phenomena can be deduced from and thereby explained by one principle only: namely, the principle that human beings act from self-interest. Against this claim Mill asserts the obvious undeniable fact that a great multiplicity of types of component causes underlie the actions of the individuals which go to make up social behaviour. Mill has this to say about explaining the actions of governing rulers.<sup>19</sup>

It is not true that the actions even of average rulers are wholly, or anything approaching to wholly, determined by their personal interest .... [I] insist only on what is true of all rulers, viz., that the character and course of their actions is largely influenced ... by the habitual sentiments and feelings, the general modes of thinking and acting, which prevail throughout the community of which they are members; as well as by the feelings, habits, and modes of thought which characterize the particular class in that community to which they themselves belong. And no one will understand or be able to decipher their system of conduct, who does not take all these things into account. They are

also much influenced by the maxims and traditions which have descended to them from other rulers, their predecessors ....

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When combined, the actions resulting from all these diverse causes have a resultant social effect that Mill calls a 'consensus' or 'aggregate'. But Mill now faces the problem of how to explain an incredibly complex phenomenon. In the same way that a composition of individual forces explains a single effect, so too do the actions of individuals in a society explain the empirical laws that we observe. But unlike the physicist's problems, who may have only a few component causes to work with, there are an enormous number of individual causal components underlying social behaviour, and because of this added quantitative complexity it is impossible to establish the individual causal components by the normal experimental methods. To apply Mill's standard Canons of induction it must be possible to actually manipulate the subject matter in a variety of ways to establish these individual causes. But society is not amenable to such manipulation because of its sheer bulk, complexity, and dynamic nature, thus it is not possible to discover the causes of social behaviour in this way.

To resolve this problem Mill exploits Comte's inverse deductive method. How the inverse method differs from the standard deductive method is (as we have already seen) in its method of verification. Ordinarily a hypothesis is verified by deducing statements of purported fact from it and making the appropriate observations to establish whether they fit the actual facts. In the case of a subject matter as complex as social phenomena, however, we work in reverse when using the inverse deductive method. Firstly, empirical laws are derived by

induction from observations of the relevant social phenomena.

Secondly, we verify them not by deducing statements of fact from them and comparing them against the world to see whether they fit the facts, but by showing that they could in principle have been deduced from the laws of human nature (via the laws of ethology of course). The validity of this procedure follows directly from Mill's methodological individualism: social facts must be derivable from the facts of the individuals concerned, for they alone are the real constituents of society. Furthermore, as the behaviour of these individual component causes are properly explained by the laws of human nature, then social facts too can be legitimately deduced, eventually, from these same laws of the association of ideas. As an instance of this method, Mill offers an account of how the acquisitive side of human behaviour is caused. He firstly establishes the empirical laws describing this phenomenon and then attempts to verify them by deducing them from the laws of human nature by which the acquisitive behaviour of human beings is governed: in particular, (1) 'that a greater gain is preferred to a smaller', and (2) the 'perpetually antagonising principles to the desire of wealth, namely, aversion to labour, and the desire of the present enjoyment of costly indulgences'.<sup>20</sup> By showing that the empirical laws can be inevitably deduced from (1) and (2), he has shown them to be explained by the laws of human nature. It is upon laws such as this that Mill builds a whole economic theory.

There is only one more point to make regarding Mill before completing this section, and that is his frank acknowledgement that social science can offer approximations only when making predictions of human behaviour. Like tidology and weather

forecasting, social science can never know all the relevant factors, and thus can offer no guarantees with its predictions in the way that, say, astronomy can. But if, *per impossibile*, a social scientist did in fact know all the environmental circumstances an individual would find himself in, then in principle it would indeed be possible to predict precisely the behaviour of that individual. (Note that this is not the same point as that made on page 32, namely that there are no universal historical laws; for that point was of a logical nature, i.e. empirical laws must be explained by deducing them from the laws of ethology, and hence the environmental factors must be included in the logic of the explanation. A corollary of this is that it is logically inappropriate to go beyond those environmental conditions. The point being made here, however, is of a technical nature; i.e. that the experimental techniques used to establish the relevant laws and environmental factors are inadequate to give us a completely accurate report of this information). The lack of precision in these predictions need not, however, detract from their pragmatic value for the purposes of the economist, the politician, or the social engineer. For when applied to the collective masses of individuals, the idiosyncrasies in the behaviour of individuals tend to be cancelled out and the consensus can be relied upon for making predictions accurate enough to be of considerable value. From these predictions, the social engineer can take whatever steps are necessary to gain his ends by changing the circumstances of the masses. Two examples of such talk:<sup>21,22</sup>

When the circumstances of an individual or of a nation are in any considerable degree under our control, we may, by our knowledge of tendencies, be enabled to shape those

circumstances in a manner much more favourable to the ends we desire, than the shape which they would of themselves assume.

The subject to be studied is, the origin and sources of all those qualities in human beings which are interesting to us, either as facts to be produced, to be avoided, or merely to be understood: and the object is, to determine, from the general laws of mind, combined with the general position of our species in the universe, what actual or possible combinations of circumstances are capable of promoting or of preventing the production of those qualities.

The anticipation of Skinner's operant conditioning and Popper's social engineering is obvious in this aspect of Mill's philosophy.

### III. HEMPEL'S COVERING-LAW MODEL

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Perhaps the most well-known exposition of the deductive nature of scientific explanation written in the twentieth century is the one jointly written by Carl Hempel and Paul Oppenheimer in their classic paper 'The Logic of Explanation'. The logical model contained in this paper, Hempel and Oppenheimer claim, is the one that all scientific explanation conforms to, either implicitly or explicitly, when explaining an event, no matter what its nature. In this section I wish first of all to explain this model, commonly known as the 'covering-law model', and then show how it applies to explaining human behaviour in the social sciences.

#### Nomological Explanations

The word 'nomological' is used to indicate that scientific explanations work by subsuming events under the appropriate laws of nature (the word is derived from the Greek '*nomos*' meaning 'law'). According to Hempel and Oppenheimer, an explanation takes one of two forms depending on the type of natural laws used in the explanation. It is either 'deductive-nomological' or 'probabilistic-nomological'. Consider each in turn.

(1) Deductive-nomological explanations. Any explanation consists of two parts: (1) the explanandum, a statement describing the event to be explained; and (2) the explanans, a set of premises describing both (a) the relevant antecedent causal conditions, and (b) the appropriate natural law or laws under which the causally related events are subsumed. Hempel and Oppenheimer impose certain conditions which must be met for any event to be properly explained under the covering-law model.<sup>23</sup>

I. *Logical conditions of adequacy*

- (R1) The explanandum must be a logical consequence of the explanans; in other words, the explanandum must be logically deducible from the information contained in the explanans; for otherwise, the explanans would not constitute adequate grounds for the explanandum.
- (R2) The explanans must contain general laws, and these must actually be required for the derivation of the explanandum ....
- (R3) The explanans must have empirical content; i.e., it must be capable, at least in principle, of test by experiment or observation ....

II. *Empirical condition of adequacy*

- (R4) The sentences constituting the explanans must be true.

To better emphasize the continuity with Hume and Mill's idea of causal explanation, the conditions quoted above can be encapsulated by the following schema.

<u>EXPLANANS:</u>	C1,C2,...,Ck	Statements describing antecedent conditions
	L1,L2,...,Lr	Statements describing general Laws
-----		
<u>EXPLANANDUM:</u>	E	Statement describing the event to be explained

None of this should be new to us, for it was all contained or implied in the previous Humean and Milleian accounts of causal explanation. The most important historical similarities to note here are the following.

(1) The conceptual distinction between an event and its cause, with the corollary that to deduce the one from the other necessarily requires a middle premise. It is due solely to the conceptual separability of an event from its cause that the

logical condition (R2) in the quote above is required. If it were not so required, it would imply that an event and its cause were not conceptually distinct after all, i.e. that they directly entailed each other in some way.

(2) The laws contained in the explanans are of the form 'an event of the class A causes an event of the class B'; i.e. whenever an event *a* of the class A occurs, an event *b* of the class B invariably follows.

(3) A general statement of the form 'all A's are B's' must be empirical -- that is, it must be testable by experience. This results directly from Hume showing that the nature of the relation between an event and its cause is not necessary but contingent. For if in an explanation the laws were not empirical, that is, if A's were necessarily followed by B's, then it would follow that the explanation would not be a causal explanation at all, this because A's and B's would not be conceptually distinct but logically related in the first place. The result would be that the so-called empirical law connecting A's and B's would really be some sort of analytic rule of inference (this will be discussed in more detail below) and not a contingent empirical statement at all.

In summary, the conditions (R2) and (R3) are logical corollaries of the conceptual distinction which Hume made between events and their causes almost two centuries before. It is also worth noting that in condition (R3) Hempel is not only vaguely in the empiricist tradition, but in the strictest 'everything back to impressions' Humean tradition as well. He considers that the meaning of any significant scientific statement must ultimately be reduced to observational terms which designate 'more or less

directly observable attributes of things or events, such as, say, "black", "taller than", "burning with a yellow light", etc., but no theoretical constructs such as "aliphatic compound", "circularly polarized light", etc.'.<sup>24</sup> Even the meaning of psychological terms must be reduced to confirmable observation statements, otherwise they must be dismissed as metaphysical nonsense. The word 'pain', for instance, can be retranslated without loss of empirical content into a description that consists of a set of observable physical events -- certain vocal utterances, contorted facial expressions, moving about in a manner that we have learnt to associate with the concept of pain, specific events in the central nervous system, and so on. In other words psychological words are really just compressed descriptions of the sort found in the observational vocabulary of physics. Hempel even goes so far as to make the bold claim that if someone were to feign mental disorder in a court of law, then all we need do to establish the truth of the matter is conduct a comprehensive physical examination, taking into account especially occurrences in the central nervous system.<sup>19</sup> The task of the discipline we call psychology is really just to explain human and animal behaviour by subsuming it under the causal laws derived from the observed constant conjunction of motives and beliefs (described in physiological, i.e. physicalist terms) with their consequent actions (likewise described in bodily movement, i.e. physicalist terms).<sup>20</sup>

(2) Probabilistic Explanation. The way the second type of explanation differs from the first type of nomological explanation is that the explanans does not **deductively** imply the explanandum. In the probabilistic explanation, that is, both the

explanandum and its negation are compatible with the explanans.

Yet this is not to deny the respectability of probabilistic explanations. Indeed it is to reaffirm their position in science by making them consistent with the empiricist tradition that treats causally related events as conceptually distinct and connected by a middle statement in the form of an empirical law. The relation between the explanans and the explanandum is of a different logical type than the one in the deductive-nomological explanation, for it is not one of logical deduction, but of inductive support; i.e. the explanandum is expected, or is very likely, or is practically certain, given the body of evidence contained in the explanans. The difference in logic between deductive-nomological and probabilistic-nomological explanations results from the difference between the laws characteristic of each type of explanation. The deductive explanation on the one hand incorporates laws that are deterministic and take the form 'all members of class A are followed by a member of class B', whilst the probabilistic explanation on the other hand contains at least one law that is merely statistical. Such laws give the probability of an event of a class C, say, being followed by a member of the class D. The probability value is calculated according to the relative long-run frequency with which we have observed events of these two classes to have been conjoined. In symbolic form this reads as follows:

$$p(D,C)=r$$

That is, the probability of an event of class D occurring given the occurrence of an event of class C is r.

The important point being made here is that **both** types of explanation -- deductive and probabilistic -- are properly

described as 'nomological'; for whilst the laws encompassed in the explanans of both types of explanation do indeed describe a different type of empirical relation between the classes of events they subsume (deterministic and statistical respectively), nevertheless both types of laws are universal in the sense that they state **invariable** empirical relations between those classes of events. A deterministic law states that everywhere, over all time, all members of class A are conjoined with a member of class B. A statistical law states that, everywhere, over all time, the probability of a member of the class C being conjoined with a member of the class D is  $r$ . (The differences between the two types of law are not to be confused with the problem regarding the amount of inductive support for any given law. Both types of law, deterministic and statistical, must face the problem of induction -- this problem therefore cuts across the distinction made between these two types of laws). Now if  $r$  is very high (close to 1), then we may say that given the occurrence of a member of C, then it is very likely, or practically certain that a member of the class D will follow. Given the antecedent conditions C, and the statistical law given above, we have the following schema.

$$\begin{array}{c}
 C \\
 \\
 p(D,C) \approx 1 \\
 \text{=====} \quad \text{[is practically certain]} \\
 D
 \end{array}$$

The double line, as opposed to the single line in the deductive explanation, is to make it quite clear that the logical relation between the explanans and the explanandum in a probabilistic explanation is of a different type to that of a deductive explanation. The single line in the latter logically guarantees

the outcome, the double line of the former implies only that it is practically certain given the evidence in the explanans.

There is a source of possible confusion that must be clarified here. In the deductive-nomological explanation, the relation between the explanans and the explanandum is a logical relation between statements, not between the events themselves that these statements describe. The same applies to the probabilistic explanation. This subtlety is displayed by the technical difference between the meanings of the terms 'likelihood' and 'statistical probability'. The former term indicates the nature of the **logical relation between the statements** of an explanation when one of the premises is a statistical law, and the latter expresses an **empirical relation between the events** referred to by that statistical law. The terms 'likelihood' and 'statistical probability' imply different types of relations and must not be confused, otherwise one will be led to think that an explanandum statement in a probabilistic explanation is to be related to the explanans in the same way as the events subsumed under the statistical law are related to each other -- one relation is of a logical nature, the other is of a contingent empirical nature. When we are talking about the **logic** of explanation, we mean the relations between statements, not the empirical relations between events.

Both types of explanation outlined above are ideals that working scientists never in fact attain. Some working scientific explanations are 'elliptic' due to premises that are only implied in the explanans; consequently we cannot logically infer the explanandum from them, either deductively or probabilistically. Other explanations are only 'partial' because they can explain

only one aspect of the explanandum; hence they also do not allow us to logically infer an explanandum statement which describes an event in all its aspects, and so once again the explanans statements can only give us reasonable grounds for expecting a given event. (This type of explanation, however, should not be confused with a probabilistic explanation, for both deductive and probabilistic explanations can be partial in this sense.) The problem here is that the explanandum cannot be stated accurately enough, it is impossible to describe every aspect of any given event or object, and therefore an explanation can only explain a limited number of an object's aspects.<sup>27</sup> Indeed, some scientific explanations may be so inaccurate that they are designated as an 'explanation sketch' only. Explanation sketches are really only suggestions as to how the ideal explanation of a given event should go, i.e. they give an indication as to the direction in which research should proceed to fill the gaps of this incomplete explanation. Because of the enormous complexity of social phenomena, it is most likely, Hempel claims, that all the social scientist can ever provide us with are explanation sketches.

### Dispositions

There is another variant of scientific explanation which needs detailed consideration for it plays an especially large part in the social sciences. This is the type of explanation given for the occurrence of an event in terms of its 'dispositions'. For example, 'the window broke when it was hit by a stone because it was brittle', or 'he swore profusely because he was angry and his wife spending too much at the hairdressers was the last straw'. It will be profitable to

consider the problem of dispositions in the sciences generally

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before proceeding to their specific use in explaining human behaviour. There are, it seems, at least three different philosophical accounts of what it is to be a dispositional concept, and each has important implications for the covering-law model of explanation.

The first kind of account of dispositions is that espoused by the metaphysical realists. They assert that a disposition is to be contingently identified with an underlying physical state or mechanism of an object or mind which causes certain public behavioural manifestations. That is, there are two ways in which a dispositional concept may be discussed; (1) in terms of its intrinsic underlying physical structure, or (2) in terms of the behavioural manifestations that are the causal effects of the underlying mechanism in (1). The relation between the underlying state and its behavioural manifestations is contingent (due to the conceptual distinction between causally related events), and thus the second way of defining dispositional concepts can in theory be eliminated and replaced by the first type, i.e. by contingent identification. It is just because of this fact that we can talk of the underlying structures without dragging in the behavioural manifestations. Indeed, it is precisely the role of the scientific enterprise to make this replacement -- to discover the intrinsic nature of this state or mechanism and describe it in the vocabulary of physics and chemistry, it being more 'scientific' to explain behaviour by making clear just what causal mechanism is involved than merely enumerating the manifestations of that mechanism. In the meantime, because we are ignorant as to the nature of this state, scientists must use

dispositional concepts defined in terms of their manifestations and not in terms of their underlying physical nature. Thus 'it broke because it was brittle' is acceptable for now. In the long run, in principle at least, such dispositional talk will disappear when the physical and psychological scientists have completed their task of explaining absolutely everything in terms of underlying causal mechanisms. The molecular configuration of a pane of glass, for instance, is supposedly the real basis of its possessing the disposition of brittleness (indeed, its being brittle just is its possessing a certain molecular configuration), and hence is the real causal factor of the window breaking easily when sharply struck. By discovering the actual nature of that molecular configuration the scientist will have given us the real causal basis of those behavioural manifestations. It is also just because of the contingent relation between the underlying mechanism and its behavioural manifestations that dispositional explanations can be given in terms of hypothetical 'if ... , then ... ' statements without dragging in the causal mechanism involved, e.g. 'if the glass is brittle, and if it is struck, then it will break'. But the important point remains however, we can in principle eventually replace dispositional talk defined in terms of manifestations with talk of underlying causal mechanisms, and this is possible because of the contingent relation between the two.

A second account of dispositional concepts is the type offered by Ryle and Wittgenstein. For them the relations between dispositional concepts and their manifestations are not mere contingent constant conjunctions of, say, brittle objects (i.e. those possessing a certain type of underlying structure) breaking

easily when sharply struck, instead breaking easily when sharply struck just is part of the concept of being brittle. There is a logical relation between being brittle and breaking easily, and not merely a contingent empirical connection. Under this story dispositions cannot really be **causes** at all, because dispositions are **defined** in terms of their manifestations in such a way that they are necessarily, and not contingently, related to them. Due to the definitional nature of dispositions they are the logical rules of our language by which we are able to infer from antecedent circumstances to their consequences. Another feature in which the logic of dispositional explanations differs from covering-law explanations is that the former apply directly to individuals, whereas causal general laws do not. The latter are universal and mention no individuals at all, but rather, classes of events. To attribute a disposition to an individual on the basis of our knowledge of that individual *ipso facto* allows us to predict and explain the behaviour of that individual without recourse to any general laws. Inferences are then allowed by virtue of the definitive nature of dispositions, and not the fact that some generalization has been made about the behaviour of the individuals that possess a certain disposition. It follows that explanations of this type consist in finding the appropriate dispositional concept under which to classify a given event, for by doing just that the event is explained, i.e. its conceptual links are made clear. For example, the question 'Why didn't you ring me last night when you had promised to?' can be answered by 'I'm sorry, I've got a really bad memory' just because not doing what one had agreed to just is one of the things that forgetful people do, and all such actions are classified under the

~~dispositional concept of forgetfulness. (In this paragraph I~~  
have no more than briefly summarized what is to be expanded in much greater detail in Chapters Three and Four. All I wish to do here is to show that Hempel is not fighting straw men when he argues his case for dispositional explanations being yet another form of causal explanation, i.e. one that logically necessitates a natural law).

The third account of dispositional concepts, which is the one Hempel himself uses and is taken from Rudolph Carnap's philosophy, tries in a sense to have some of both the above theories. To introduce it in general terms first. Dispositional terms do not refer to any inferred underlying states of an object at all, but are concepts that are operationally defined in terms of the experimental tests specifically designed to establish the introduction of these same terms into the language of science. But this is not to say that they are definitional in quite the Rylean/Wittgensteinian way, for the relations existing between the many different manifestations of a given disposition are contingent and must be discovered, rather than conceptual and known *a priori*.

The Hempel/Carnap story is but the outcome of the tradition that I have been trying to capture from the beginning of this chapter. Namely the empiricist tradition that makes events and their causes logically distinct, and the only way to bring them together again is to have a middle premise in the form of a natural law. Given that all scientific explanations follow the covering law-model, then dispositional explanations too must take this form, and that implies that dispositional statements themselves must take the form of a general law. The crucial

problem for the logical positivist is to somehow give an account of dispositions in terms of observation statements, for dispositional statements do not describe what is happening now (categorical statements of occurrences) but what is likely to happen given certain conditions.<sup>28</sup>

[D]ispositional concepts ... [are] predicates which enunciate the disposition of a point or body for reacting in such and such a way to such and such conditions, e.g. 'visible', 'smellable', 'fragile', 'tearable', 'soluble', 'indissoluble', etc.

The problem is, of course, that talk of mere possibilities has no more right to be in an empiricist vocabulary than does talk of 'powers', 'pushes', and 'pulls'.

To make the notion of a disposition acceptable Carnap uses 'reduction sentences' to translate dispositional talk (i.e. hypothetical 'if ... , then ... ' statements) into observational predicates (i.e. terms describing what we can and do publicly observe). What this means is that dispositions are not real properties over and above what we observe at all -- as opposed to the metaphysical realists' notion of 'underlying mechanisms' -- but a phenomenalist redescription of what we actually do observe.

A dispositional property Q3 is operationally defined as being applicable to an object according to the following reduction sentence.

$$Q1 \rightarrow (Q3 \equiv Q2)$$

This reads: if the experimental conditions Q1 are obtained in the laboratory, then the predicate Q3 applies if and only if the consequences Q2 obtain. The point of this logical apparatus is

quite simple. In the reduction sentence there is nothing which implies a need to go beyond observations to establish the presence of a disposition, for its presence is operationally defined in observational terms alone. Accordingly, they do **not** refer to any occult state or power. An example of a reduction sentence in use would be the following test for an object being brittle; if an object  $x$  is sharply struck ( $Q1$ ), then  $x$  is fragile ( $Q3$ ), if and only if  $x$  breaks ( $Q2$ ).

$$Q1(x) \rightarrow (Q3(x) \equiv Q2(x))$$

The value of reduction sentences for the scientist is that they enable him to design experiments on the basis of them and is thus able to introduce a new dispositional predicate into the language of science. Until such time as a non-observational predicate can be reduced to observational terms, it has no empirical meaning and cannot therefore belong to the vocabulary of science.

At this stage Carnap complicates matters in a way which makes his account diverge radically from the Rylean/Wittgensteinian conceptual story. Unlike 'single-tracked' dispositions such as 'brittleness' and 'solubility' which have only the one manifestation, i.e. 'breaking easily' and 'dissolving in water', most dispositions are 'multi-tracked', i.e. they manifest themselves in an indefinite number of ways depending upon the relevant antecedent circumstances present at the time. As a consequence, a set of several different reduction sentences can be used to establish whether a dispositional concept applies to an object. As each reduction sentence corresponds to a particular test experiment, it follows that an

indefinitely large number of different experiments can be used to establish the introduction of a dispositional term -- as many as there are ways in which the disposition can manifest itself. The complication arises because it is not possible to provide in advance the 'complete' set of reduction pairs for some dispositional concept Q3, there being no definite or fixed number of experiments for establishing the presence of a disposition; the best we can do is establish an entirely open-ended set of the form  $\{(Q1',Q2'),(Q1'',Q2''), \dots ,(Q1^n,Q2^n)\}$ . The point here is that the number n is indefinite and unknown, thus we can never know *a priori* whether we have exhausted all possible reduction sentences for that disposition. And hence it follows directly that Q3 can never be fully defined because it is possible that the set of reduction pairs can always be added to. We may, of course, make a decision at some point that a given set of reduction sentences was indeed sufficient to fully define a dispositional predicate. But that would have to be at best an arbitrary or *ad hoc* definition which might well lead to embarrassing results in the future. For what should we say to a new reduction sentence that supposedly established the presence of a disposition but was not a member of the set that we had at some stage previously decided on as the complete definition of Q3? We would have to say in this case that the new reduction pair did not, indeed, could not, establish the presence of the disposition at all, for it would be analytic *a priori* that what was not contained in the complete definition could not provide the necessary and sufficient conditions for the use of the predicate, and hence the term could not possibly apply in these new circumstances. Due to the arbitrary and indefinite nature of

dispositional concepts, both Carnap and Hempel wish to deny that dispositional concepts are analytic or definitive in the Rylean/Wittgensteinian way, and assert instead that dispositional concepts consist of a loose cluster of partial definitions related in some contingent way. To summarize this point, no set of reduction sentences, regardless of how inclusive it may be, can be taken as a complete definition of a disposition. For this to be the case, the definiens and the definiendum must be synonymous, and as they are not, it follows that a dispositional concept cannot be analytic.

The conditions provided by certain reduction sentences can however be used as 'representative sentences' for the whole set. This because it can be demonstrated by experiment that, as a matter of contingent fact, any object  $x$  that satisfies the sufficient conditions for possessing a disposition  $Q_3$  also satisfies the conditions provided by any other given reduction sentence for that dispositional concept. This feature places the concept of a disposition firmly within the covering-law model of explanation. After all, the relations between the individual reduction sentences which are contained in the cluster of operational definitions are themselves empirical generalisations, i.e. the dispositional concept has empirical content (the logical condition ( $Q_3$ ) on page 38). Hempel brings it all together very nicely.<sup>29</sup>

[O]ne of the necessary conditions for an iron bar being magnetic might be:

If an iron bar  $x$  is magnetic then if iron filings are placed close to  $x$  (condition  $S_1$ ), the filings will cling to its ends (response  $R_1$ ).

And one of the sufficient conditions might be:

If an iron bar  $x$  is in the vicinity of a compass needle (condition  $S_1$ ) then if one of its ends attracts the north pole of the needle and repels the south pole,

whereas the other end shows the opposite behaviour  
 (response  $R_1$ ), then  $x$  is magnetic (has property  $M$ ).

But jointly, these two symptom sentences imply the general statement that any iron bar which satisfies the compass needle condition also satisfies the iron filings condition: and this surely is not a definitional truth, but a statement that has the character of an empirical law.

(The pair  $S$  and  $R$  for Hempel are, of course, 'stimulus' and 'response' respectively, and these correspond to the pair  $Q_1$  and  $Q_2$  in Carnap's account.) It is but a short step to argue from the above that a dispositional explanation really is causal in the covering-law sense. Once it is given that an object or individual possesses a disposition (according to a 'representative sentence') then the middle premise (the dispositional statement) quite rightly takes the form of a general statement, in this case a hypothetical 'if ..., then ...' statement. The explanation takes the logical form; if  $x$  has a disposition  $Q_3$ , and if certain antecedent conditions obtain, then certain consequences follow as a matter of contingent fact. 30

Suppose ... that in order to explain why a given particular object or individual  $i$  behaved in a certain manner, say  $R_3$ , it is pointed out that  $i$  was in a situation of kind  $S_3$ , and that  $i$  has the broadly dispositional property  $M$  whose presence is characterised by the disposition to respond to  $S_1$  in manner  $R_1$ , to  $S_2$  in manner  $R_2$ , to  $S_3$  in manner  $R_3$ , and so on. This explanatory argument may then be schematized as follows:

(C1)  $i$  was in a situation of kind  $S_3$   
 (C2)  $i$  has the property  $M$   
 (L) Any  $x$  with the property  $M$  will, in a situation of  
       kind  $S_3$ , behave in manner  $R_3$   
 -----  
 (E)  $i$  behaved in manner  $R_3$

This account is clearly of deductive-nomological form; for the general statement  $L$  ... has to be accorded the status of an empirical law rather than that of a "mere definition."

## Dispositions and Explanation in the Social Sciences

This more-or-less standard, more-or-less empiricist account of dispositions is a powerful methodological tool for explaining the actions of human agents in terms of their beliefs and motives. When taken over to the social sciences it is commonly known as the 'Rationality Principle'. Firstly, in explaining a given human action, it takes into account the ends the human agent desired, the alternative courses of action he believed were available to him, and the circumstances he believed himself to be in. All of these factors come under the title of 'the logic of the situation'. Secondly, we assume in this type of explanation that the agent was rationally disposed at the time he performed the action. Thirdly, we insert a middle premise, the Rationality Principle, of the form 'an agent who is rationally disposed at a certain time will act appropriately to a given situation at that time', i.e. the agent will do that which offers the best prospects given the logic of the situation. Dispositional concepts can be either deterministic or statistical, and hence the dispositional explanation will be deductive-nomological or probabilistic-nomological in character depending on the dispositional concept contained in the explanans.<sup>31</sup> Using the Rationality Principle to explain an action X performed by an agent A would conform to the following schema.

- (1) A was in a situation of type C (the logic of the situation).
- 
- (2) A was disposed to act rationally.
- (3) Any person who is disposed to act rationally will, when in a situation of type C, invariably (or with high probability) do X.
- 
- (4) A did (or was very likely to do) X.

(the line would be double if the empirical relation between C and X was statistical).

This type of explanation is nomological because it has the following features: (1) and (2) are antecedent conditions, (3) has the form of a natural law, and (4) is the probable or certain outcome (and furthermore is conceptually distinct from (1) and (2)). Depending on the other emotional or character dispositions of the agent, this type of explanation can be used to give an account of other types of behaviour by inserting the appropriate disposition. Using this method then, we can in principle explain all types of human behaviour.

It will now be apparent why an account of dispositions was given earlier. In opposition to the metaphysical realist, Hempel denies, like any consistent empiricist should, that dispositions are hidden powers or causal mechanisms. But more importantly, Hempel must also deny the Rylean/Wittgensteinian account of dispositions, for if the latter version of dispositions is correct, then the antecedents and consequences of the explanation would not be conceptually distinct at all but would imply each other in some way. In the schema above, for instance, (3) would be logically implied by (2) and would thus not be an empirical law at all but actually part of the meaning of (2). The result would be that dispositional explanations would not be

causal, a conclusion that Hempel would not be willing to accept due to his commitment to the unity of scientific method (that is, to the ubiquity of causal explanation).

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CHAPTER TWO  
POPPER'S 'NEW' METHOD

It would be no exaggeration to say that Karl Popper is responsible for a major redirection of the philosophy of science this century. He has written extensively on the methodology of both the natural and social sciences, epistemology, metaphysics, evolution, political philosophy, the philosophy of history, and many other topics. One has only to skim through the Philosopher's Index to see the overwhelming influence he has had in contemporary philosophy. His fame rests mainly upon the methodology of science he proposed prior to World War Two and its implications. In recent years Popper has introduced a new evolutionary ontology that lies behind and supports his early method. There are four major points I want to make about Popper's work in this chapter: (1) his methodology of science, (2) his explanation of human behaviour, (3) his pluralistic ontology, and (4) an appraisal of his social science in light of his method and ontology.

### I. POPPER'S ANTI-POSITIVISM

Popper's immediate target was the positivist philosophy espoused by the Vienna Circle, but the implications of his philosophy have an impact upon the assumptions of all empiricism right back to Hume. Popper has often been accused of being a covert positivist, but as I hope to show in this chapter, his philosophy really is radically different in most, but not in all, respects. His general intention in the philosophy of science, for instance, was not to distinguish sense from nonsense, i.e. to distinguish significant empirical statements from metaphysical pseudo-statements as the logical positivists attempted to do, but to provide a criterion of demarcation by which science can be

distinguished from non-science. Furthermore, his principle of demarcation was intended to cut across the distinction made by the logical positivists. It was quite possible, for instance, that a metaphysical statement could indeed be scientific according to the principle laid down by Popper, and hence could still be properly used. Thus, theoretical terms such as 'electron' and 'magnetic field', he claims, could very well refer to purported entities genuinely existing behind phenomena. Such talk for the logical positivists, on the other hand, would be metaphysical and unacceptable. (As we shall see below, it is not being verifiable that establishes such theories as being proper candidates for a scientific vocabulary, but the fact that a scientist can derive statements from them which can in principle be falsified). Finally, non-scientific statements are not to be classed as mere nonsensical rubbish and ignored, Popper insists, for at some later date they may very well provide the grounds for an inspiration which enables a scientist to frame a hypothesis which is scientific; the logical positivists were far too prone to jump the gun in this respect.

To understand Popper's demarcation principle we must first understand the main reasons why he disagreed with the basic tenets of any thoroughgoing positivism. The traditional empiricist picture of scientific method consists (as in Chapter One) of three steps. The first is the scientist collating a large data base of facts (for example, collecting and measuring lots of birds). The next step is the forming of an inductive hypothesis from the patterns or regularities observed in this data base (for example, the statement 'all ravens are black' is induced by observing that every raven that has so far been

observed has been black). The last step is the testing of the hypothesis (for example, by performing experiments according to such techniques as Mill's inductive Canons to verify that all ravens are in fact black, breeding for albinism, looking elsewhere, and so on). Once we have discovered, tested and verified a general hypothesis of the form 'all A's are B's' in this way, it then possesses the status of a theory or law by which we can explain the occurrence of the events subsumed under it by the deductive method of causal explanation.

Popper disagrees with every one of the above procedures except the one contained in the last sentence. In particular he disagrees with the notion that induction plays an especially important part in science at all, and in fact goes so far as to say that there is no such thing as induction at all if what we take as induction is the deriving of regularities from observations of brute facts. He has two reasons for saying this.

(1) Since the time of Hume, everyone has accepted that the method of induction can never prove that a statement such as 'all A's are B's' is universally true. This because no matter how many observations we make of an A being conjoined with a B, we can never infer that **all** A's are actually conjoined with B's because we can never know that we have experienced all possible A's. In other words, the statement can never be **fully** verified. Consequently, the empirical condition (R4) that Hempel demanded in his covering-law model, namely that the laws contained in the explanans must be known to be true can never, even in principle, be met.

(2) Moreover, we never do make observations and then induce hypotheses from them. We **always** start from a particular problem

and make our observations accordingly; that is, the problem provides the background against which we select the relevant data. In fact, Popper thinks, the passive receptance of sensations which the positivists have traditionally asserted cannot be the case. This criticism goes much deeper than just the traditional empiricist theory of induction, for if human beings actually pick out certain types of events that are 'lit up' according to a theory or problem, then we have to rethink the traditional empiricist theory of perception as well.<sup>1</sup> It likens a mind storing up sensations it has passively received to the way a bucket holds liquid that has been poured into it (the 'bucket theory of mind'); the bucket has not done anything, it is just a container which was initially empty. Popper opposes this passiveness with a 'searchlight theory' of mind: we do not ever simply observe, we always observe from a particular point of view depending on our purpose -- we are selectors of relevant information, not passive receptors of sensations.

Popper concludes from (1) and (2) that induction and verification do not form part of the logic of science. To fill their roles Popper pointed out an obvious feature of the testing of hypotheses which had not been emphasized before. Whilst the statement 'all A's are B's' can never be fully verified, no matter how many occasions we see the statement confirmed, it needs only **one** case of an A not being a B to falsify it. This is the simple logical principle of *modus tollens*; that is, 'if  $p$ , then  $q$ . But not  $q$ . Therefore not  $p$ '. It was this very simple observation of logic that Popper developed into a principle whereby science was distinguished from non-science.

The new principle of demarcation is called 'the

Falsification Principle'. For a hypothesis to be scientific, it must in principle be possible for there to be some state of affairs that would count as falsifying it. By using the Falsification Principle Popper rules out such activities as astrology and psycho-analysis as mere pseudo-sciences. Both of these he claims are set up in such an *ad hoc* manner as to avoid any possible falsification. Accordingly, they can have no real empirical content because they are compatible with every possible state of affairs in the world. As the whole point of a scientific statement is to impart information by telling us something significant about how the world actually goes by *describing* some ways it does not go, then such activities do not enlighten us in the way that science does. Astrology and psycho-analysis are so vague in their definitions and *ad hoc* in their reasoning that any so-called 'explanation' offered by these pursuits could never in principle be proved wrong -- they are always 'right'; but they are only so at the expense of being totally vacuous, they have nothing of empirical content to offer at all. (As we shall see below in Popper's arguments for the unity of science, they do not even meet the criteria for being part of any respectable intellectual discipline at all.)

Furthermore, the scientist designs experiments in an honest attempt to falsify his hypothesis by deducing empirical consequences from it which can be put to the test. That is, whilst traditional empiricists (and so too the astrologers and psycho-analysts) would put all of a scientist's efforts to confirming or verifying a hypothesis, Popper would have the scientist attempting to falsify it. If the hypothesis is

falsified, then a better hypothesis must take its place. If the hypothesis is not falsified, then we can use it as a heuristic device which allows us to successfully explain and predict events until such time as it is falsified. The fact that a hypothesis has not been falsified to date does not prove its truth, all that we can say is that it has been 'corroborated' to a greater or lesser degree. The more tests the hypothesis survives the more it is said to be so corroborated. The process of corroboration is not to be confused with induction however, for unlike the latter it is a measure of the extent to which the empirical content of the hypothesis has been tested in the past, and is not merely a measure of confirming instances as is the case in astrology and psycho-analysis. To be more explicit, the difference between corroboration and induction is a corollary of at least the following three distinctions: corroboration is a matter of or a measure of (1) **past testedness**, whereas induction relies on the metaphysical Principle of the Uniformity of Nature, i.e. that future causes will resemble past causes -- there is no such assumption underlying Popper's notion of corroboration; (2) **past testedness**, i.e. of the *modus tollens* deductive procedure rather than inductive generalization procedures; (3) **past failures to falsify**, not a record of past successes of confirming instances.

The problem still remains as to the origin of a hypothesis if induction is rejected as a valid procedure. The quick answer is that it doesn't matter. It can come from a dream, an insight, an inspiration, a hallucination, or an accident. In short, it is a product of **creation** in just the same way as a work of art, it need not be derived from observations. This does not rule out,

of course, the possibility that observations may prompt one into having an inspiration of some sort that will lead to fruitful hypotheses. But the important point is that the problem of the origin of hypotheses is a matter for the psychologist to investigate, it has absolutely nothing to do with the logic of science which deals only with the objective content of and the logical relations between hypothetical statements. Upon being confronted by a problem, a scientist makes a conjecture and then tries to falsify it according to the logic of the *modus tollens* -- nothing else is relevant, especially the context of discovery. It is useful to recall here for the purposes of contrast the sceptical conclusions that Hume arrived at, i.e. that our beliefs about how the world 'really goes' can be accounted for in terms of the habits or dispositions of the human mind rather than some metaphysical intuition or insight. He was in effect limiting philosophy, and hence the validity of philosophical conclusions, to what Popper would call the 'psychology of discovery', i.e. a causal explanation of how we come to possess certain metaphysical beliefs. Popper, on the other hand, wishes to investigate the testability of the statements which those beliefs give rise to -- for that, according to Popper, is all that is of concern to science proper, never the genesis of those beliefs.

All the above conclusions result from Popper being a metaphysical realist. For him a hypothesis is true if and only if the objective state of affairs in the world which it supposedly describes does in fact obtain. We can never know that a statement does correspond to a fact, but on the other hand, as we have seen, it is possible to know that it does not so correspond. The more empirical content a hypothesis has, the

more testable consequences we can deduce from it. It follows therefore that the more content a hypothesis has, the more likely it is to be falsified. It is often the case in science that more than one hypothesis is competing to explain a given problem, in such a situation we must decide between them by the method of testing and falsification -- the one that survives will be the one we use in the meantime until that one too is falsified and another hypothesis is put in its place. As theories succeed one another, we get closer and closer approximations to the truth, that is, successive surviving theories converge towards a certain point. However, we can never know if and when we have got to the final point of convergence, and must never assume that we have -- for then the activity of hypothesis testing and elimination would cease, and this would lead to a stagnation of true science (i.e. the conjecturing of testable hypotheses would stop). It is because of this 'weeding out' process that Popper describes true science as 'an evolutionary approach' to objective knowledge. It is interesting to note that Popper's methodology of science, upon being divorced from the correspondence theory of truth, is reminiscent of C.S. Peirce's pragmatism. He too incorporated a Darwinian flavour into his epistemology to the effect that only the 'best' hypotheses survive, the others are 'weeded out' in the process of testing them against experience. For Peirce, the ones that survive are the ones we use in our everyday practical affairs, and this just is them meeting the pragmatic conception of truth.

As I mentioned above, Popper does have one point of agreement with his empiricist predecessors; that is, in scientific explanation we deduce the explanandum from an

explanans containing statements describing initial conditions and empirical laws.<sup>2</sup>

[T]o give a causal explanation of a certain *specific event* means deducing a statement describing this event from two kinds of premises: from some *universal laws*, and from some singular or specific statements which we may call the *specific initial conditions*.... [W]e can never speak of cause and effect in an absolute way, but must say that an event is a cause of another event -- its effect -- in relation to some universal law. However, these universal laws are very often so trivial ... that as a rule we take them for granted instead of making conscious use of them.

The difference between Popper's 'New Method' and the empiricist tradition culminating in Hempel, is that whilst Hempel insists that the law(s) of nature in the explanans must be known to be true for any event to be explained; Popper denies that such a condition can ever be met, and insists therefore that we must remain content with hypotheses that have been well corroborated. Since this is the only real point of difference between Hempel and Popper in regard to the **deductive** nature of science, then in the end it must be admitted that Popper follows in the Humean tradition just as the empiricists do in asserting one of the alluding themes this dissertation is concerned with, that cause and effect are conceptually distinct.<sup>3</sup>

[E]vent *A* is the cause of event *B*, and event *B* the effect of event *A*, if and only if there exists a language in which we can formulate three propositions, *u*, *a*, and *b*, such that *u* is a true universal law, *a* describes *A*, and *b* describes *B*, and *b* is a logical consequence of *u* and *a* .... [E]xplanation becomes then a kind of description; it is a description which makes use of universal hypotheses, initial conditions, and logical deduction. To Hume ... is due what may be called the most important contribution to the theory of causation; he pointed out (as against the Cartesian view) that we cannot know anything about a necessary connection between an event *A* and another event *B*. All we can possibly know is that events of the kind *A* ... have so far been followed by events of the kind *B* ... Our theory fully recognizes this Humean criticism. But it differs from Hume (1) in that it explicitly formulates the *universal*

*hypothesis* that events of the kind *A* are always and everywhere followed by events of the kind *B*; (2) that it asserts the truth of the statement that *A* is the cause of *B*, provided that the universal hypothesis is true. -- Hume, in other words, only looked at the events *A* and *B* themselves; and he could not find any trace of a causal link or a necessary connection between these two. But we add a third thing, a universal law; and with respect to this law, we may speak of a causal link, or even of a necessary connection.

It is beyond doubt that Popper is a faithful follower of the 'conceptual distinction' tradition. The only time we can talk of a logical or deductive connection in scientific explanation is via a middle premise, and this takes the form of a general empirical law. The concept of cause does not involve essentialist mechanisms.

## II. POPPER'S PHILOSOPHY OF SOCIAL SCIENCE

Popper exploits the deductive nature of scientific explanation in an attempt to prove the unity of science, that is, the unity of the natural and social sciences. Depending on our purpose or interest, we can use the deductive nature of science for prediction, explanation, and testing. And this is possible solely because all these activities exploit the same logic, i.e. the deductive nature of causal explanation. Hempel made this observation also, but did not develop it in the way that Popper has. This is because Hempel and the other logical positivists were attempting to prove the unity of science by showing that the vocabularies of all the various sciences could be reduced or translated in some way to the one physicalist language consisting of words that were either observation terms themselves or were in turn reducible to observation terms (as in the case of dispositional words). Popper is not interested in any such physicalist reduction but in showing how all intellectual disciplines are united because; (1) they are all deductive in nature, and (2) they are concerned with the falsification, as opposed to the verification, of hypotheses. This is true regardless of the subject matter; i.e. whether it be the historical understanding of the actions of another person far removed in time, explaining the motions of the planets, interpreting or translating a historical or literary document, deriving sociological laws, or predicting economic trends.

Popper shows the unity of these disciplines by firstly distinguishing between three groups of sciences.

(1) The first group consists of the 'pure' disciplines such as physics, chemistry, and sociology. It is not the task of

these disciplines to explain singular events, but to establish highly corroborated hypothetical universal laws. The only reason these sciences are interested in singular events is because the singular events are, as always, the sole means by which hypotheses can be tested; that is, for the pure sciences, singular events are mere means to ends.

(2) The next group are the 'applied' sciences such as medicine, mechanical engineering, and social engineering. These sciences are characterised by them using the laws established by the pure sciences to deal with specific future singular events, i.e. to predict and control them. Thus the engineer uses the laws established by physics to calculate the stresses and strains of a planned bridge so that it can be designed to withstand them. In this case the end for the engineer is the construction of a particular object, the bridge, and the laws provided by the first group, the 'pure' sciences, are means to this end. In the same way the laws established by the biological sciences are used to predict the behaviour of and thereby control the spread of a disease. This latter group is, then, distinguished from the former by its interest in predictable future events, i.e. to either bring them about or control them in some way, and they do so by using the laws established by the pure sciences.

(3) The last group are the 'historical sciences'. They include any discipline concerned with explaining any given singular event, i.e. one which has actually happened. These scientists are not restricted to human history -- a rock tumbling down the side of a hill is as much a historic event as a battle being won. The emphasis in the historical sciences is upon finding the antecedent conditions, via the natural laws

established by the pure sciences, to explain the event in question. The geologist, for example, will wish to explain why that particular layer of rock was at the depth it was rather than at some other depth where it is normally found; and the paleontologist will wish to know where the skull that he has just uncovered fits onto the evolutionary tree. The explanation in both cases will incorporate the laws that have already been well corroborated by the relevant generalising sciences. Likewise the historian will wish to explain events of human history. In many cases (as in Hempel's 'elliptic' explanations) some laws are so trivial that they would never interest any practitioner of the pure generalising sciences and need not therefore be mentioned explicitly in the explanans.<sup>4</sup>

[I]n history ... the host of trivial universal laws we use are taken for granted; they are practically without interest .... If we explain, for example, the first division of Poland in 1772 by pointing out that it could not possibly resist the combined power of Russia, Prussia, and Austria, then we are tacitly using some trivial universal law such as: 'If of two armies which are about equally well armed and led, one has a tremendous superiority in men, then the other never wins.' ... Such a law might be described as a law of the sociology of military power; but it is too trivial ever to raise a serious problem for the students of sociology, or to arouse their attention.

The differences between the pure sciences (testing), the applied sciences (predicting and controlling), and the historical sciences (explaining), are then logically dependent upon the relation their purpose has to the singular event described in the explanandum of a causal explanation. It follows that the unity of science is a result of the deductive nature of explanation. Thus the unity of science is a direct consequence of the conceptual distinction between events and causes made by Hume in

the eighteenth century -- causal explanation always comes back to conceptual distinction.

### Methodological Individualism

Like Mill, Popper claims that all social events can be reduced to the actions of individuals. But unlike Mill, he rejects the notion that these individual actions can be reduced to the laws of psychology. To understand how these claims are derived, we must examine the distinction between 'methodological essentialism' and 'methodological nominalism'.

The former asserts that science must explain phenomena in terms of ultimate explanations. A splendid example of such a philosopher is Locke. His hypothesis was that ultimate explanations could be given in terms of the movements and configurations of the minute constituents of matter (i.e. corpuscles) which cause the phenomena we observe. That is, Locke had not escaped the Cartesian story of underlying causal mechanisms (note the similarity here to the metaphysical realist account of dispositions). Of course, we can never know the nature of these mechanisms due to the limitations of our senses, but if we could overcome this problem (which is a contingent matter only), then scientific explanations could be based upon these mechanisms or essences. We would then have the ultimate science dealing in ultimate explanations, not with conjectures and hypotheses. (We have already come across an example of a methodological essentialist philosophy in the social sciences with Mill's attempt to reduce all social phenomena to the ultimate laws of human nature, but more on this below). Essentialist philosophies often begin their investigations with a

search for a definition of these realist essences, assuming that we cannot talk about such things and explain their manifestations until we have achieved this first step. Unfortunately however, many of these philosophies never really get past this preliminary stage.

The methodological nominalists, on the other hand, do not incorporate essential natures -- of any variety -- into their explanations, but describe events in terms of their manifest behaviour only.<sup>5</sup>

Instead of aiming at finding out what a thing really is, and at defining its true nature, methodological nominalism aims at describing how a thing behaves in various circumstances, and especially, whether there are any regularities in its behaviour. In other words, methodological nominalism sees the aim of science in the description of the things and events of our experience, and in an 'explanation' of these events, i.e. their description with the help of universal laws. And it sees in our language ... the great instrument of scientific description; words it considers rather as subsidiary tools for this task, and not as names of essences. The methodological nominalist will never think that a question like '*What is energy?*' or '*What is movement?*' or '*What is an atom?*' is an important question for physics; but he will attach importance to a question like: '*How can the energy of the sun be made useful?*' or '*How does a planet move?*' or '*Under what condition does an atom radiate light?*'.

Whilst the essentialists, then, wish to explain the workings of nature by resorting to ultimate causal mechanisms, the explanations of the nominalists consist of compressed descriptions of regularities as in the empiricist tradition.

Popper identifies himself as a methodological nominalist. This has important implications for his philosophy of social science, for when we talk of social institutions we are not thereby referring to any reality existing behind social phenomena. We are only using 'theoretical constructions' or

'models' to explain concrete social events -- and this technique is not the least bit essentialist, i.e. they do not describe any 'essences' behind phenomena.<sup>6</sup>

[M]ost of the objects of social science ... are abstract objects; they are *theoretical* constructions. (Even 'the war' or 'the army' are abstract concepts .... What is concrete is the many who are killed; or the men and women in uniform, etc.) These objects, these theoretical constructions used to interpret our experience, are the result of constructing certain *models* (especially of institutions), in order to explain certain experiences -- a familiar theoretical method in the natural sciences (where we construct our models of atoms, molecules, solids, liquids, etc.). It is part of the method of explanation by way of reduction, or deduction from hypotheses. Very often we are unaware of the fact that we are operating with hypotheses or theories, and we therefore mistake our theoretical models for concrete things.... The fact that models are often used in this way explains -- and by so doing destroys -- the doctrines of methodological essentialism. It explains them, for the model is abstract or theoretical in character, and so we are liable to feel that we see it, either within or behind the changing observable events, as a kind of permanent ghost or essence. And it destroys them because the task of social theory is to construct and to analyse our sociological models carefully in descriptive or nominalist terms, that is to say, *in terms of individuals*, of their attitudes, expectations, relations, etc. -- a postulate which may be called 'methodological individualism'.

This paragraph, out of all that Popper has written, best summarizes his whole philosophy of social science. For it welds together Popper's methodological nominalism and methodological individualism. Society consists of individuals or atoms, and social events are reducible to the actions of those individuals; furthermore, there are no essences lying behind and causing social behaviour that words such as 'state' and 'government' name. The abstractions mentioned in the quote are used in the historical sciences only for the purposes of explaining singular events (by being used as middle premises) and not for postulating hidden essences. It follows that the actions

subsumed under these models are logically prior to these intellectual constructions -- there never was a 'state' or 'government' until there were social scientists to abstract them from the actions of individuals.

### Situational Analysis

Popper's account of situational analysis is quite different from Hempel's in some important respects. In particular, as I pointed out at the beginning of this chapter, Popper's philosophical emphasis lies in problem situations. Thus an agent's action is most accurately described as an attempt to solve a problem he is directly confronted with; it follows, then, that to describe the agent's problem situation just is to explain the action. But there is an implied premise here, i.e. the Rationality Principle, to the effect that any normal or sane human being will act rationally, i.e. appropriately, to a given problem situation. More formally, there are three parts to this type of explanation.

- (1) (a) The analysis of the problem situation; i.e. a set of statements describing the agent's aims, beliefs, and influences (environmental and social).
  - (b) A premise to the effect that the agent was sane at the time he performed the action.
- (2) The general (trivial) law that sane people act more or less rationally, i.e. appropriately to the perceived problem situation.
- (3) The statement describing the agent's action -- deducible from the statements in (1) and (2).

In other words, according to Popper's general schema, if we have a statement describing the action an agent has performed (3), and premises in the explanans to the effect that the agent was

rational (1b), and the trivial law that rational agents act more or less appropriately to a problem situation (2), then we can always work backwards to the antecedent conditions, i.e. the problem situation (1a). **It follows directly that the antecedent conditions are the causes of the agent's behaviour.** This is because the whole schema satisfies the logical and empirical conditions for a causal explanation. Situational analysis is an example of the historical sciences discussed above, exploiting both (a) the deductive nature of scientific explanation (due to the conceptual distinction between cause and effect) and (b) the methodological nominalist's model, in this case the model is the 'Rationality Principle'.

The above paragraph describes briefly what Popper dubs the 'zero method' and is based upon the hypothesis that agents will act more or less rationally most of the time. The 'zero method' is a model assuming perfect rationality, i.e. the agent will do exactly that which is most likely to achieve his ends. The degree of rationality (or irrationality) attributed to any given action is a measure of its deviation from the model of perfect or ideal rationality, i.e. the 'zero co-ordinate', the actual behaviour therefore being an approximation only to the ideal behaviour contained in the model.<sup>7</sup>

There are some important points to consider here.

(1) As I have already indicated, Popper agrees with Mill to the extent that explanations must be given in terms of individuals, but does not agree that actions are reducible to ultimate psychological laws of human nature. To reduce them so would be, for Popper, an example of methodological essentialism, i.e. an explanation in terms of that which remains constant

behind all outward manifestations. Thus rationality is not about anything inner, but about publicly observable behaviour that is a response to a given problem situation, and indeed, it is given **entirely** by the logic of the situation. The psychological dispositions possessed by the perfectly rational agent are, for Popper at least, quite trivial and certainly not important enough to be included in the explanans. It is only when the agent is acting abnormally, i.e. not fully rationally, that we need resort to psychology, and then, of course, the Rationality Principle does not apply.

(2) The middle premise contained in this type of explanation, i.e. the Rationality Principle, is neither an *a priori* definitional statement (as in the Rylean/Wittgensteinian notion of dispositions given in Chapter One) nor is it an essentialist ultimate Millian law of human nature.<sup>8</sup>

[M]ost historical explanation makes tacit use, not so much of trivial sociological and psychological laws, but of what I have called ... the *logic of the situation*; that is to say, besides the initial conditions describing personal interests, aims, and other situational factors, such as the information available to the person concerned, it tacitly assumes, as a kind of first approximation, the trivial general law that sane persons as a rule act more or less rationally.

This **must** be the case given that Popper has argued for the unity of scientific method. Otherwise, if the Rationality Principle were a Wittgensteinian or Rylean definition, then an action could not be conceptually distinct from the problem situation that it attempted to solve, and explanations of human actions would not therefore be of a causal deductive nature. This would be unacceptable to Popper because it would be an exception to his argument for the unity of science based upon the deductive nature

~~of explanation -- i.e. all explanation is causal.~~<sup>9</sup>

If, on the other hand, it were an essentialist law of human nature (as in Mill's philosophy), then it would no longer have the conjectural and therefore falsifiable status that all scientific empirical hypotheses must have. For, as is the nature of all ultimate explanations, it would be assumed to be correct and thus the search for better hypotheses would stop. The Rationality Principle, Popper insists, is a conjecture just like any other hypothesis. It takes the form of an idealised or abstracted model in much the same way as Newton's laws do (see the above quote on page 73 regarding models), and like all ideal models is fallible because it is an approximation only. Popper makes it quite explicit in his paper 'The Rationality Principle' that the Rationality Principle is indeed an empirical conjecture only, and like all other empirical conjectures is most probably wrong. He even goes so far as to make a successful attempt at falsifying it to prove just this point.<sup>10</sup> He claims, however, that the continued use of it is justified on pragmatic grounds. For even though it is only an approximation to the truth, it can, like Galileo's ideal pendulum, be used to great practical and theoretical advantage: firstly, it can be used successfully in the applied social sciences to predict and control typical patterns of social behaviour; secondly, it can be used, again with success, in the historical sciences to explain past actions of individual human beings; and thirdly, its value as a heuristic or methodological device in the pure sciences far outweighs its empirical content or significance (it is, after all, a **trivial** law). If we assume in the meantime that the model is true, then from it we can derive further testable conjectures with a much

higher empirical content as to the typical conditions that give rise to the particular types of behaviour which are of interest to us (i.e. to make the 'zero method' applicable to more and more types of situations), and if well corroborated they can be used as the middle premises of the calculations and deductions in the applied and historical sciences.

(3) Another point can be put only briefly now since it will be discussed in greater detail below: the agent's action will never quite match the zero co-ordinate. This is because his response to the problem situation is based upon a decision which is a conjecture or hypothesis only as to the ideal means with which to achieve his ends, and, like all conjectures, can never be considered as more than an approximation to the ideal model (Popper's 'fallibilism'). An agent's progress in achieving his aims can be explained by the following schema.

$$P1 \rightarrow TT \rightarrow EE \rightarrow P2$$

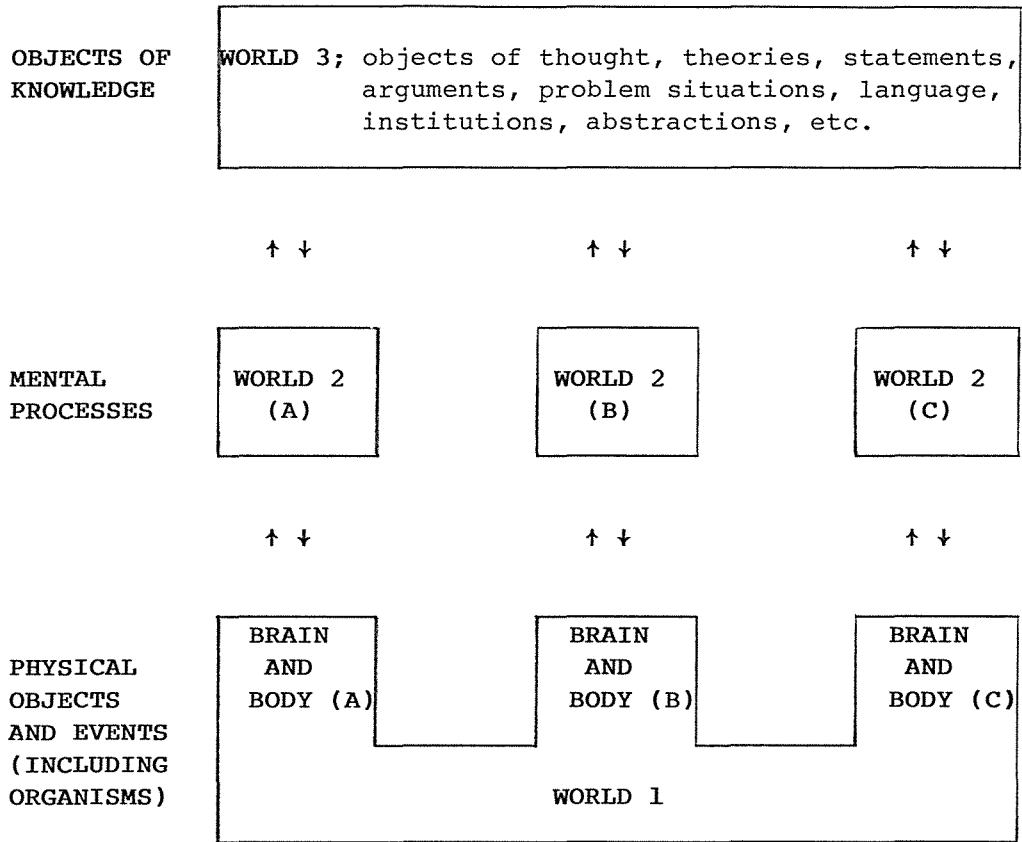
Where P1 is the problem situation the agent perceives himself to be in; TT is his tentative theory as to the best means to achieve his ends; EE is the error elimination, i.e. the resultant testing he put TT to by carrying it out, with the subsequent realisation that it does not quite reach his expectations; and P2 is the new problem situation arising due to the modification of P1 by TT and EE. From P2 another conjecture (TT) is made which eventually leads to another modified problem situation, and so on -- the process never stops.

(4) Explanation by situational analysis is, however, more complicated than just that, for in explaining an agent's action we are ourselves making a conjecture. We are also responding to a problem situation, namely, the problem situation of

understanding ( $P^u$ ). Accordingly, we too are in the process of making a tentative theory (TT), i.e. a reconstruction of the agent's problem situation (P1); our conjecture also is bound to be wrong. In the light of new evidence -- a recently discovered historical document or the testimony of a reliable witness -- our conjecture will likewise be subjected to a process of error-elimination and falsification in the same way as the schema above. We will then find ourselves in a new problem situation regarding the problem situation of the agent, and the process continues accordingly. This is but another example of science being the activity of making conjectures and testing them. **All** rational behaviour is explained in terms of an agent making conjectures as to the best means for obtaining ends and the subsequent correction of those conjectures given their inadequacy. Science too is a rational activity following the same pattern; and indeed, according to Popper, the most rational of all human pursuits in virtue of it being the most disciplined and critical in its problem solving techniques.

### III. THE THREE WORLDS ONTOLOGY

It was not until Popper incorporated a new version of the correspondence theory of truth into his philosophy, in opposition to the contemporary pragmatist and coherence theories, that he finally felt comfortable with his realism. Correspondence theories have traditionally held that a statement is true if and only if its objective content corresponds to the facts; and it is closer to the truth if it corresponds to the facts more closely than do other competing statements. It is just this latter feature of approximate correspondence which allows us to derive closer and closer approximations to the truth. This in itself is nothing new, but in Popper's hands it gives rise to a whole new pluralistic ontology. The question as to the nature of the objective content of a statement had never been adequately answered. To solve this problem Popper postulated a pluralism consisting of three worlds. The most interesting of which, world 3, contains the objective and independent objects that correspond to the facts when a true statement is made. The facts to which these world 3 objects correspond are states of affairs in the other two worlds -- 'world 1' contains the objects of the physical world, and 'world 2' contains the contents of human consciousness. The following diagram will help show the ontological relationships between these three worlds.<sup>11</sup>



(A, B, and C are human beings consisting of an interactionism of minds in world 2 and bodies in world 1)

Truth, then, consists in a correspondence between world 3 objects and objects belonging to the other two worlds. To make true statements about natural objects is to have a correspondence between world 1 and world 3 objects, and to make true statements about mental processes or states is to have a correspondence between world 2 and world 3 objects. No other correspondence is possible -- particularly between worlds 1 and 2 -- and hence all knowledge is objective. Knowledge is, then, knowledge 'without a knowing subject'.

In support of the purported existence of a third world, Popper makes the observation that we often **discover** truths that

have existed prior to the discovery. In the study of pure mathematics, for instance, logical relations have often been discovered existing between numbers; relations that have existed ever since the number system has been in use, but which for most of that time have not been known (e.g. Goldbach's Conjecture). Because such relations were already there, independently of our cognitive processes, Popper concludes that truth is objective, not subjective (i.e. it does not lie in anything we say or think) -- truth consists in a correspondence between facts in worlds 1 and 2 and objects existing independently of us, these objects are the contents of 'world 3'.

It appears, at first sight at least, that Popper's ontology is dangerously close to essentialism, the very thing he rejects. It should be realised, however, that the argument Popper delivers against essentialism is not an ontological argument, but a methodological one. His argument does not run along the lines 'there are no such things as essences'; indeed he explicitly states that he agrees with essentialism if by that it is meant there is much hidden from us.<sup>12</sup> What he is really arguing is that the activity of science does not aim at ultimate explanations in terms of those essential natures. To emphasize; if the essentialists stated this as their method, then *ipso facto* they would assume that any hypothesis they made was a stab at an ultimate explanation, and thus would not attempt to falsify it. If one thinks that a particular hypothesis is indeed an ultimate explanation, then there would be no need for further research because it would be assumed that there is no further explanation to be sought. The history of science has shown, however, that so-called ultimate explanations have always been rejected in

favour of better ones. Methodological essentialism has a stagnating effect upon science and must therefore be rejected (Popper has similar arguments against instrumentalism). When the methodological and the ontological strands are disentangled, it can be easily seen how Popper's world 3 realist ontology and methodological nominalism are compatible.

Several points about the three worlds ontology need to be clarified before proceeding.

(1) The three worlds are **ontologically** distinct; each is a real world containing real objects.<sup>13</sup>

What is the ontological status of the third-world objects? ... are problems, theories, and arguments "real", like tables and chairs? ... I am prepared to accept something like a materialist starting point according to which, in the first place, only physical things like tables and chairs, stones and oranges, are to be called "real". But this is only a starting point: in the second place we are almost bound to extend the range of the term radically: gases and electric currents may kill us: should we not call them real? The field of a magnet may be made visible by iron filings. And who can doubt, with television such a familiar phenomenon, that some sort of reality has to be attributed to Hertz's (or Maxwell's) waves? ... All the examples given have one thing in common. We seem to be ready to call real anything which can *act upon physical things* such as tables and chairs ... and which can be acted upon by physical things. But our world of physical things has been greatly changed by theories, ... that is by third-world objects. Thus these objects should be called "real".

(It is interesting to note that this 'proof' which Popper the philosopher of science offers for the reality of world 3 objects is exactly what Popper the Greek philosophy scholar would have known in Plato: for in the Sophist Plato says 'anything has real being that is so constituted as to possess any sort of power either to affect anything else or be affected'<sup>14</sup> -- it is always useful when reading Popper to remember that he is a Plato scholar.)

(2) Worlds 1 and 2 interact, and so too do worlds 2 and 3, but worlds 1 and 3 cannot interact except through world 2, i.e. by human actions (Popper and John Eccles, a brain scientist, have made a combined effort in giving a neuro-physiological basis for this interaction).

(3) The objects of world 3 can be recorded in both worlds 1 and 2. In world 1, these world 3 objects are recorded in books, libraries, pictures, films, museums, and so on; and in world 2 these same world 3 objects can be recorded in states of consciousness such as memory and thought.

(4) World 3 is Platonic in the sense that its contents are independent and autonomous. But it is importantly different from Plato's world of Forms in that the contents of world 3 are **created** by the activity of human beings, it is only afterwards that they become autonomous. Plato's Forms, on the other hand, are timeless, they have always been there. Another important similarity between Plato's world of Forms and Popper's world 3 is that for both Plato and Popper, these objective worlds are 'grasped' by the intellect in the same way as Plato's slave boy 'sees' the Pythagorean theorem in the Meno. In this sense, Popper is more a rationalist than, for instance, the usual British empiricist.

### Objective Understanding

Popper carries over the objectivity of world 3 and so too the objectivity of science into the area of hermeneutics in the social sciences and humanities, i.e. to the problem we began to discuss in the last section of being able to understand and explain another person's actions. Understanding has

traditionally been thought of as a subjective process on the part of the person trying to do the understanding, e.g. Collingwood's 'empathy' and Weber's 'Verstehen'. But according to Popper, understanding is to be given strictly in objective world 3 terms: the subjective world 2 processes involved in empathy with others are as trivial and irrelevant in the social sciences as is the source of any hypothesis we use to understand the physical world in the natural sciences. Popper does not deny that empathy may indeed be a valuable source of hypotheses, but as in the natural sciences, the origin of a hypothesis is not relevant to the logic of understanding. It has been seen earlier how an agent's action is explained by reconstructing his problem situation. We must now try to do this using the proper methods. Our task is not only to give an objective account of how the agent perceived his situation to be, i.e. give a world 3 description of the agent's world 2 subjective processes, but must also give a description of the world 1 situation as it really was in world 3 terms.<sup>15</sup>

In order to understand their (inadequate) actions, we have therefore to reconstruct a wider view of the situation than their own. This must be done in such a way that we can see how and why the situation as they saw it (with their limited experience, their limited or overblown aims, their limited or overexcited imagination) led them to act as they did; that is to say, adequately for their inadequate view of the situational structure.

We must always keep in mind that objective knowledge is knowledge without a knower, it is a correspondence between world 3 objects and independent, discrete, and describable brute facts existing in worlds 1 and 2.<sup>16</sup>

[I] am a realist in holding that the question whether our man-made theories are true or not depends upon the real facts; real facts which are, with very few exceptions, emphatically not man-made. Our man-made *theories* may clash

with these real *facts*, and so, in our search for truth, we may have to adjust our theories or to give them up.

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This should make the schema

$$P1 \rightarrow TT \rightarrow EE \rightarrow P2$$

appear in a new light. The terms used in this schema belong to world 3, they are objective terms describing brute facts, and they describe the agent's problem situation both as it really was (world 1) and as he perceived it (world 2). Not only is the agent's problem situation described in such terms, but the objective world 3 description of his action TT is measured against the zero co-ordinate (i.e. ideal rationality) which is itself an objective world 3 object. In other words, the measure of rationality for any given action is completely objective, there is no hint at all of any normative relative criteria being involved.

Given that all respectable explanation is deductive in nature, then we reach the earlier conclusion that human actions, along with all other types of events, are caused -- an agent's action is logically distinct from the problem situation that it arises in. It is for exactly this reason and no other that Popper went to such great pains to make the Rationality Principle an empirical law, even though it is only trivial and approximate, and not anything *a priori*. This should be even more obvious now that Popper is using a brute fact (i.e. discrete and independent) ontology -- how else could Popper link the agent's action and the problem situation? Both these facts are discrete, and so too must be the world 3 objects corresponding to them; Popper is committed to this given his three worlds ontology and correspondence theory of truth. The only way to explain one in

terms of the other is to insert a middle premise. Causal explanation has always remained central throughout Popper's philosophical development, and the explanation of human actions is no exception.<sup>17</sup>

The ... concept ... which may require elucidation is the idea of explanation or, more precisely, the idea of a *causal explanation* .... [T]he basic logical schema of every explanation consists of a (logical) deductive inference whose premises consist of a theory and some initial conditions, and whose conclusion is the explicandum.... In the social sciences, the premises of the explanation usually consist of a situational model and of the so-called 'rationality principle'.

To further demonstrate the unity of science and the objectivity of scientific knowledge, Popper asserts that situational analyses and measurements of rationality are not restricted to the behaviour of human beings, but to **all** living things -- whether they be plants, animals, or unicellular organisms. Problem solving for Popper is the very characteristic that distinguishes life from non-life. It is by solving problems that organisms evolve; if they do not or cannot, they quickly become extinct. The hypotheses of plants and animals do not consist of precise and sophisticated empirical statements, but take the form of those behavioural or anatomical modifications which better enable them to cope with environmental pressures.<sup>18</sup> Thus we can make conjectures of the problem situations that animals and plants are confronted with in the same way as we do for human beings.<sup>19</sup>

On the animal level it is of course *always* conjectural ... if a scientist conjectures of an individual animal or species (say, some microbe treated with penicillin) that it has reached a solution (say, becoming penicillin resistant) to a problem facing it. Such an ascription sounds metaphorical, even anthropomorphic, but it may not be so: it may simply state the conjecture that such was the

environmental situation that unless the species (or population of organisms) changed in a certain way (perhaps by an alteration in the distribution of its gene population) it would get into trouble.

It is quite proper to say, then, that we can 'understand' plants and animals in the same way we understand human beings. This follows because understanding consists in an **objective** correspondence between world 3 objects and world 1 and 2 objects, and hence understanding in both the natural and the social sciences is qualitatively the same -- understanding the observed behaviour of men is the same as understanding the observed behaviour of amoeba. Not only can we say that we 'understand' plants and animals, but we can also describe these living organisms as being rational, i.e. responding in the appropriate way to a given problem situation. Evolution then, according to Popper, is a history of rational organisms continually overcoming one problem only to be confronted by another according to the logical schema  $P1 \rightarrow TT \rightarrow EE \rightarrow P2$ . The organisms that are successful and survive are the ones that are 'best able to judge' the objective problem situation accurately. There are no subjective processes involved in the logic of rational behaviour.

The major difference between human animals and the rest of the living world is that the former have been blessed with a language that possesses higher functions than do the primitive languages of the lower organisms. Human language contains, over and above these more primitive languages, the '*descriptive function* and the *argumentative function*'.<sup>20</sup> Due to this difference human beings can progress much further than other animals, for these superior functions of language not only enable us to create world 3 objects, but also to manipulate them and add

to them, i.e. the contents of world 3 undergo an evolutionary process in just the same way as the living objects of world 1. Popper points out how the amoeba and Einstein differ in respect to falsifying hypotheses.<sup>21</sup>

The difference between the amoeba and Einstein is that, although both make use of the method of trial and error elimination, the amoeba dislikes erring while Einstein is intrigued by it: he consciously searches for his errors in the hope of learning by their discovery and elimination. The method of science is the critical method.

This feature of science is made possible only through the critical function of language, i.e. the amoeba cannot grasp world 3 objects, Einstein can.<sup>22</sup>

#### IV. SUMMARY AND APPRAISAL

In summary, Popper's deductive method of science and speculative metaphysics imply the following assumptions and corollaries:

(1) The unity of scientific method; i.e. all explanation is causal, no matter what the nature of the subject is. All intellectual disciplines depend on the deductive nature of explanation, this because of the conceptual distinction between causally related events.

(2) Realism; i.e. worlds 1 and 2 consist of brute facts that can be described in objective world 3 terms, and truth consists in a correspondence between them. Human actions and the problem situations in which they occur are also able to be described in brute fact terms.

(3) An identification of actions with bodily movements; this is implied in (a) his methodological nominalism, i.e. that

the subjective processes are totally irrelevant to explaining an agent's action (all that is relevant is the objective problem situation), and (b) his ascription of rationality to unicellular organisms, i.e. using trial and error methods (in this case the jerky movements of the amoeba when in a problem situation) to overcome problems just is acting rationally.

(4) Social institutions are mere abstractions existing independently of human actions and only for the purpose of serving as explanatory models. Language, another social institution, also consists of world 3 objects which can be considered in abstraction from human activities.

(5) Rationality is accounted for in terms of a response to a problem situation, both of which are described in objective world 3 terms. Hence rationality has nothing to do with conventions or normative principles.

(6) Mind and body are entities that interact in the traditional Cartesian way.

This list contains many points that are rightly disputed in contemporary philosophy. Popper claims to have revolutionised scientific methodology. But I think he has not escaped or even wanted to escape the traditional empiricist notions that (1) human behaviour is caused, and (2) that there are brute facts which can fully account for it. Accordingly, just like Hume, Mill, and Hempel, Popper has really been attempting to give a naturalistic account of human behaviour.

Popper's explanation of human behaviour in terms of situational logic and the rationality principle is partly right but also partly wrong. It is wrong because the metaphysical

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props underlying it are ill-conceived, and it is right because we often do explain human behaviour by giving reasons for it, i.e. the agent's beliefs and aims. It is time to look now at a philosophical tradition which attempts to expose the logic of such reason-giving explanations in a totally new way, emphasizing rather than downplaying how radically human action words differ in meaning from physical event words.

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CHAPTER THREE  
RULES AND UNDERSTANDING

## I. WITTGENSTEIN ON CRITERIA AND UNDERSTANDING

In the previous chapters I traced a philosophical tradition in which it was claimed that all explanation is deductive, it being a logical requirement to insert a general law in the explanans to deduce the explanandum from the antecedent conditions. The explanandum cannot be deduced from statements describing antecedent conditions alone because they do not imply each other due to their conceptual separability. The covering-law model holds not only for the explanation of natural events, but also for the explanation of human behaviour; to explain a human action is to deduce it from its causal antecedents and the appropriate empirical laws.

A tradition that opposes any such causal explanation of human behaviour stems from the later philosophy of Ludwig Wittgenstein and develops in the work of Peter Winch and John Searle. Before returning to the question of causal explanation however, it is necessary to introduce two important parts of Wittgenstein's later philosophy, namely his technical notion of criteria, and his view of what it is to attribute understanding to an individual.

### Wittgenstein on the Notion of 'Criteria'

The concept of a 'criterion of identity' is one of the central themes running through the Philosophical Investigations. How do we establish that a person is in pain? How do we judge whether two objects come under the same concept? How do we distinguish between different types of things? What makes an X an X and not a Y or a Z? These were the sorts of questions

Wittgenstein had in mind when he made the logical distinction between a 'criterion' for an X and a 'symptom' for the same X. Both criteria and symptoms are types of evidence we resort to when justifying the use of a term 'X'. Wittgenstein's problem lies in giving a justification for asserting the presence of a purported X which does not rely upon merely contingently associated concomitants of X, but which is not purely definitive of X either.<sup>1</sup>

To the question "How do you know that so-and-so is the case?", we sometimes answer by giving '*criteria*' and sometimes by giving '*symptoms*'. If medical science calls angina an inflammation caused by a particular bacillus, and we ask in a particular case "why do you say this man has got angina?" then the answer "I have found the bacillus so-and-so in his blood" gives us the criterion, or what we may call the defining criterion of angina. If on the other hand the answer was, "His throat is inflamed", this might give us a symptom of angina. I call "symptom" a phenomenon of which experience has taught us that it coincided, in some way or other, with the phenomenon which is our defining criterion. Then to say "A man has angina if this bacillus is found in him" is a tautology or it is a loose way of stating the definition of "angina". But to say, "A man has angina whenever he has an inflamed throat" is to make a hypothesis.

There are some important qualifications regarding the criterion/symptom constraints that Wittgenstein sets himself.

(1) If p is a criterion for q, then the relation between p and q is of a logical nature, i.e. p is **non-inductive** evidence for q. On the other hand, if r is a symptom for q, then the relation between them is not logical but strictly contingent, it is **inductive** evidence for q, and hence to affirm the presence of q and r is not to confirm a logical relation as in a criterial relation, but to draw a correlation between two logically distinct events.

(2) Knowledge of criteria is learnt in the process of being

taught the use of a word within the contexts that it normally arises. Knowledge of symptoms, on the other hand, is established after having learnt the use of the word by noting concomitants to its criteria. Accordingly, knowledge of criteria is in a strict sense prior to knowledge of symptoms. We cannot possibly draw a correlation between a  $q$  and its symptom  $r$  if we cannot identify  $q$  to begin with; and to do that logically presupposes knowing not symptoms but criteria of identity.<sup>2</sup>

When I say the ABC to myself, what is the criterion of my doing the same as someone else who silently repeats it to himself? It might be found that the same thing took place in my larynx and in his. (And similarly when we both think of the same thing, wish the same, and so on.) But then did we learn the use of the words: "to say such-and-such to oneself" by someone's pointing to a process in the larynx or the brain?

We learn to use the words 'to say such-and-such to oneself' in perfectly ordinary and public circumstances (criteria of application), not by noting concomitant 'processes in the larynx or brain' (symptoms). Criteria are necessarily public and contextual. (This is important to Wittgenstein's special attack on Cartesian dualism as well as to the general philosophy of social science.)

(3) To articulate the criteria for the correct use of a word and thereby make obvious the connections it has with the contexts it arises in, just is to give an account of the word's meaning (with the proviso of (4) below). It follows that to understand a word 'X', or to identify a thing as an X, we must know the criteria of justification for the use of the word 'X'; moreover if there are no criteria for the use of that word, i.e. there are no contexts in which it has a proper use, then it is vacuous --

it has no meaning. On the other hand, none of the symptoms of a word have such a tight connection with the notion of meaning. None of this means, however, that we can or do normally articulate such criteria, for that is usually an extremely difficult task. In most circumstances we just know how to apply a word in the proper way without reflecting upon its relevant criteria due to the training we have received. All that is required for a word to have meaning is that it be possible to make obvious its criteria by giving a 'perspicuous representation' of the conceptual links it has with its surroundings (an example of such a representation will be given in the next chapter).

(4) From the last point it might be assumed that the presence of the criteria *p* for the correct application of a term '*q*' is logically conclusive for the justification of asserting the presence of the thing *q*. But this is not the case. The criterial relation between *p* and *q* is not one of logical entailment, for if *p* occurs it is not a logical contradiction to say that *q* does not. This is because the relevant circumstances or background must be taken into account when it is used correctly. For example, a man may manifest pain behaviour -- but upon learning that he is practising for an audition, say, we would not then think it appropriate to attribute pain to him. This feature about the relation between a criterion and the concept for which it is a criterion follows from there being an indefinite (i.e. not known *a priori*) number of criteria in which a concept may properly apply, i.e. we cannot lay down *a priori* all the contexts in which a term can be used. (This does not apply, of course, to strictly analytic statements in which logical equivalences can

indeed be elucidated.) In short, no disjunctive set of criteria has a logically equivalent meaning to that for which it is criteria.<sup>3</sup>

The point just made here must not be confused with the one made in Chapters One and Two regarding the complex varying and unknown causal factors of social behaviour. Hume, Mill, Hempel, and Popper have all maintained that we are ignorant of all the relevant causal factors, and moreover it is this ignorance that has kept the social sciences in their backward state. But according to them this state of affairs is due solely to the complexity of social phenomena, not to it being qualitatively different in some way. In principle, they insist, all social phenomena can be explained by searching out the relevant causes. Now this is quite different to the point made in the above paragraph regarding the indefinite nature of criteria. To explain the difference will require an anticipation of the next section; knowing the correct application of a concept, i.e. knowing its criteria, is to grasp the rule by which the use of that concept is governed. To understand the rule just is to know in which cases the concept applies. For instance, my understanding the concept of pain in the example given above means that I do not attribute pain to someone I know is practising for an audition. If I do attribute pain to someone in such circumstances, and I am well aware of them, then I do not understand the meaning of the concept of pain. Knowing what counts as relevant to the correct application of a word just is knowing its criteria of justification, and that in turn comes about by understanding the rule that governs its use. The philosophers discussed in the previous chapters were saying

something quite different when pleading ignorance of partial causes. Their point was a contingent matter; that is, us not knowing all the causes is only a contingent state of affairs. But the Wittgensteinian point being made here, however, is of a conceptual nature.

(5) It seems to follow naturally from (4) that criteria can change, i.e. what was once a symptom can become a criterion: 'The fluctuation of scientific definitions: what to-day counts as an observed concomitant of a phenomenon will tomorrow be used to define it'.<sup>4</sup> The boundary between criteria and symptoms is not definite and fixed for all time. In science especially it sometimes happens that phenomena that allow of a precise measurement are made into a new defining criterion. This has happened most notably in cases where qualitative descriptions have given way to quantitative descriptions.

Take for instance the measurement of temperature. Before there were such things as thermometers there were only qualitative subjective methods of determining how hot something was. The village blacksmith could tell that a piece of iron was hot enough for his purposes by how close he could put his hand to it, or when it was a certain cherry-red colour as opposed to some other colour. But at the same time he exploited the fact that metal expanded upon being heated. When fitting steel tyres around the wooden rim of a wheel, he heated the tyre until it was hot enough according to the criteria he was trained to use, and then placed it over the wheel rim so that it was a tight fit when the tyre cooled and contracted. Now in this case the criteria for the everyday concept of heat were the subjective observations of a metal object feeling or looking hot; the accompanying

symptom was that same object expanding upon feeling or looking hot. Scientists used these same observations to make what was the blacksmith's symptom into a quantitative defining criterion. That is, the technical term 'temperature' is a measure of how much a column of mercury rises when encased in a glass tube due to that mercury expanding upon being heated. This is the criterion by which the doctor establishes the temperature of a sick patient, not by placing his hand on the patient's brow or noting his flushed appearance; although these too are indications (symptoms) of the patient's condition, they are not the criteria by which we measure temperature. That is, in our more technical moments we determine how hot something is by making a **quantitative** measurement.

When such a change in criteria occurs, then *ipso facto* the meaning of the term for which they are criteria changes within the activity to which that concept belongs. This is because the network of concepts surrounding the term is changed due to its new conceptual location, and thus it is used in a different way. Just think of how the concepts of pressure, temperature, and volume have become interrelated since they have become quantified.

The fact that the scientist now uses concepts differently within his own sphere of interest because of criterial changes does not mean that in our ordinary and everyday activities we must check a thermometer to establish that we are feeling hot -- the blacksmith can and still does use the same subjective criteria he has always used without fear of it being classed as obsolete. Whatever conceptual changes occur in the activity of science, it has no bearing on how everyday language does or

should change (there will be more said in support of this claim throughout the rest of this chapter).

(6) A point which is central to the chapters that follow is that the criteria for any concept are agreed upon by the members of the linguistic community that use it, i.e. it is a convention. A term does not have the criteria it has by virtue of any realist properties, but because a linguistic community decides the matter by laying down publicly observable criteria. As there is a set of conventions for any given linguistic community, it follows that no one set of conventions and criteria of identification has a greater claim to being 'the correct' description of reality than any other. This is because each description of reality is constructed according to the relative conventional criteria created by a community whose participants pursue a common interest (this will be investigated in much more detail in the next section). Hence, because each language is autonomous with respect to reality, and as it also shapes our view of reality, we can never even in principle refer to an objective reality to adjudicate which is the 'truest' language, if by that is meant the one that conforms most closely to some 'non-criterial' or 'non-conventional' reality. We can never say that the concepts belonging to one language are 'truer' than any other, although for certain interests and purposes one may be better suited to a particular task than another (and therein lies the source of the conventions in the first place).

### Understanding

We come one step closer to the main concern with social science. What now are the criteria involved in the concept of

understanding some affair? How do we tell that a person

understands, say, a mathematical series or the meaning of a word or why something happened?

The theory that has traditionally been held, especially in the Hume-Mill-Hempel tradition, is that understanding consists of certain inner events or processes taking place in the mind. I understand the meaning of the word 'red', for example, if whenever I hear that word I associate a red image with it. But as Wittgenstein points out, I can hear and understand different words whilst some one image remains constant; and conversely, I can understand the same word with different or even with no images accompanying it. In short, there is no **essential** 1-1 correspondence between words and anything like images. The criterion for understanding a word cannot therefore be an accompanying image. The same argument applies to all other candidate inner processes or events, whether they be physical or non-physical in nature. The occurrence of inner goings-on is just not essential to the concept of understanding. Rather, as Wittgenstein attempted to show, it is the relevant public circumstances surrounding a person's behaviour which provide the criteria for correctly attributing understanding to that particular person. Any inner events associated with the concept of understanding are only contingently so, they are mere concomitants that we may, given enough consistency, correlate with criteria -- **that is, they are symptoms only and have no conceptual connection with the meaning of the word 'understanding'**. Even if we did establish that certain inner events were correlated with understanding, we could not establish these events as new criteria for the concept of understanding.

This is because the criteria of the words belonging to ordinary language are essentially linked to the everyday, ordinary contexts in which we learn the use of these words (point (2) above). To take a word out of its ordinary context and force it into the concepts of science is logically inappropriate. Indeed, if we made the criteria of understanding dependent upon the presence of inner experiences, we could not even learn the meaning of the word because it would no longer have any conceptual links to public behaviour -- just imagine trying to learn psychological verbs which derived their meaning by referring to inner events or processes. It would not be possible if they had no essential connection to outward behaviour. The words we use in ordinary language must remain where they are if logical confusion is to be avoided. This does not mean that they cannot be used derivatively or metaphorically in different contexts, but it must always be kept in mind that this is a parasitic, secondary meaning and should not be imposed onto its original context in such a way that its original everyday meaning is made redundant. Ordinary language and scientific language have different contexts of application, and this must never be forgotten -- scientists can never tell us what the words belonging to ordinary language 'really' mean.

What then are the circumstances in which we can judge whether a person can understand, say, a mathematical formula? We must take into account both the historical background and present circumstances of the person concerned. If he has been properly trained in mathematics, and he has the normal pre-requisites for learning (e.g. is not insane, has a normal attention span, is not dyslexic, etc.), and has not had an accident whereby his memory

has been lost, and he can apply the formula correctly in a wide variety of cases, and so on; only in such cases can we be justified in saying that he understands the formula. We do not attribute the understanding of a mathematical formula to a toddler who has, by some chance, pressed the buttons of a calculator in the right sequence and got the right answer -- the appropriate background is missing. Likewise, if someone claims to understand a formula but gets it right with only one isolated example, or even more subtly, one kind of example, then we cannot attribute understanding to him either. In short, understanding consists of mastering a technique due to the appropriate necessary training.

The single aspect of Wittgenstein's later philosophy most crucial for our purposes, is the contingent fact that when normal human beings are given similar training, their reactions in response to that training are similar too (although, as we shall see below, this fact is not exploited in the same way as the behaviourists do). It is exactly this characteristic of human nature that makes social interaction possible. The instinctive ability of children to be receptive to training enables pre-linguistic behaviour to be modified, shaped, and extended in appropriate ways for them to develop the conceptual structures we have. It follows from this that if the training received were different, then so too would the conceptual structures resulting therefrom (amply demonstrated by the many different conceptual structures embodied in the different languages throughout the world). Given the contingent state of human nature, it is quite possible to imagine a state of affairs whereby it would not be possible to train human beings to learn concepts that are now

quite readily learnt. This is analogous to the differences between the behaviour of a cat and a dog which have both received the same 'retrieving' training. The cat can never be taught to retrieve, no matter how hard we try, but the dog very readily learns how to retrieve a duck from the river.<sup>5</sup>

It is just this agreement in actions which gives us the objective criteria for justifying the application of a particular concept. I understand the algebraic formula only if I can apply it in the same way as I was taught, and that is the way that everyone else applies it. The criteria for being 'the same' is, like every other concept, based upon public agreement of what counts as being the same for the human conventional purposes at hand. Objective justification, then, lies in the rules provided by a social convention. The greater the extent to which I am able to conform to the rules, the greater my degree of understanding. Another reason can now be seen why understanding is not to be given in terms of inner events, for if that were so we could never apply the word 'understanding' meaningfully because there would be no public and therefore teachable or learnable **objective** criteria by which such a claim could be justified in the first person.<sup>6</sup>

[T]o *think* one is obeying a rule is not to obey a rule. Hence it is not possible to obey a rule 'privately': otherwise thinking one was obeying a rule would be the same thing as obeying it.

It is important to realise that these rules, as human conventions, cannot be described as true or false by resorting to brute facts (they can, however, be applied correctly or incorrectly, i.e. their application can be either understood or misunderstood, but that is a different matter). The rules

governing human behaviour, far from being *de facto*, statistical, or deterministic in nature, are for Wittgenstein through and through normative. They are the ultimate authority we resort to for guidance in our social transactions. Actions cannot be justified by basing them on any reality existing beyond our conventions for the simple reason that our justifications stop when we reach those very conventions. They have no grounding in anything but agreement in actions of human beings living in a community, the conventions we possess being in turn but a reflection of the sorts of interests that we, as human beings, pursue.

An objection could be made at this point: surely the propositions expressed in mathematics and logic cannot be mere conventions, even if our criteria for understanding them are. The relations that these statements express are inexorable and have an irresistible compulsion derived from how things 'really are' in the world independently of us. Accordingly, mathematicians **discover** these timeless necessary relations existing in the objective world, and hence mathematical understanding is in terms of the relations grasped or intuited by our cognitive faculties (note the similarity to Popper's world 3 objects here). A mathematical theorem is true only if it is a true description of such relations. It is the ideal, timeless nature of these relations which makes logic and mathematics so compelling -- we feel that the proposition ' $2+2=4$ ' **must** be true regardless of our conventions because it is in the nature of things that that is how things are related. But Wittgenstein denies this too. For him the foundations of mathematics and logic are as much the product of instinct and training as any

other intellectual activity. Consequently mathematical propositions are *invented*, not discovered.<sup>7</sup> It is a peculiarity of our nature that we get the logical and mathematical relations that we do<sup>8</sup> -- it is not due to some rationalist insight into ontological relations existing independently of us. Wittgenstein gives an example of an individual continuing a number series in an aberrant way. This individual claims to be following the *same* rule as we do, it is just that he *interprets* this rule in a different way. But this will not do, for rules are necessarily social by virtue of them being conventions through agreement; it makes no sense to talk of that one person interpreting and following a rule by himself.<sup>9</sup>

"But how can a rule shew me 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.

"Then can whatever I do be brought into accord with the rule?" -- 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 this sign in a particular way, and now I do so react to it.

But that is only to give a causal connexion; to tell how it has come about that we now go by the sign-post; not what this going-by-the-sign really consists in. On the contrary; I have further indicated that a person goes by a sign-post only in so far as there exists a regular use of sign-posts, a custom.

Even in this arcane discipline, the foundations of mathematics, we see the same crucial point emerging: *all* interpreting, all understanding of some matter stops at conventions (conventions which belong to a community, and are taught, and reacted to similarly by individuals). The compulsion we feel in mathematics and logic is not because we intuit objective relations in the

real world, it is because these normative rules are applied so mechanically and routinely as a result of successful training and everyday use that we feel as if they had to result from an intuiting of something beyond ourselves.<sup>10</sup> We should remind ourselves that the whole point of training is to eventually do these things automatically without considering and interpreting every step -- 'I obey a rule blindly',<sup>11</sup> I do what I have been trained to do and do not reflect upon it or interpret it, I just do it.

Accordingly there is a very good reason for delving into Wittgenstein's philosophy of mathematics here. It is no accident that Wittgenstein chooses as his main targets the two traditional theories of understanding he has; firstly, we understand the meaning of a word if it bears some essential relation to an inner mental event or process (e.g. Locke), and secondly, that understanding consists in an intuitive grasp of something existing in an objective, independent, and ideal world (e.g. Plato and Popper). If there have been any prime candidates for certainty in the history of western philosophy, they have been our direct knowledge of sensations (empiricism) and the inexorability of logical and mathematical relations (rationalism). If Wittgenstein can show that the metaphysics underlying these two purported foundations of certainty are in fact myths, then he is well on the way to showing that the interrelated concepts of understanding and meaning do not involve any subjective or independent worlds at all. Rather, it is the mastery of applying a rule correctly that both these prime candidates of certainty get their perfectly legitimate kind of 'objectivity', and this objectivity comes down, in the end, to

the agreement in actions of the members of a linguistic community. The use of concepts -- whether mathematical, scientific, or psychological -- is governed by the conventions that are the property of communities, not of individuals directly confronting sensations or intuiting independent ontological relations or entities. To verify that someone understands how to apply a concept correctly is to check his use of that concept against the established rules of the community to which he belongs -- that is the criteria by which we judge, no other.

### Explanation

The conclusions reached above do not apply only to the two activities of understanding the meaning of a word or the use of a mathematical formula. They apply to all social activities -- whether it be voting, praying, talking, signalling, conducting scientific research, studying the actions of other cultures, betting, lying, sitting exams, and so on. Each of these activities is carried out in accord with a rule. And to explain any one of them is to classify it under the appropriate social concept by which it is described, thus making obvious the conceptual links it has with its surroundings. An action is meaningful if and only if it has a role in a particular community, and we as members of a community can understand why a fellow citizen performed a certain action only if he did it in accord with a rule that our community possesses. That is to say, it is only by virtue of the fact that we all follow the same rules governing our actions that we can understand them. The very ability to identify, explain, and justify actions is dependent therefore upon norms, not causes. We do not look for

the cause of an action to explain it, but for a concept under which to classify it.

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This point has already been alluded to in the first chapter in relation to the Rylean/Wittgensteinian version of dispositions and it will emerge again in the next chapter when considering Popper's Rationality Principle afresh. In the rest of this chapter, we will see how others have developed the threads of Wittgenstein's philosophy for the logic of explanation in the social sciences.

## II. WINCH'S 'THE IDEA OF A SOCIAL SCIENCE'

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The central thesis of Winch's book is that all meaningful behaviour is, without exception, meaningful in virtue of being rule-governed. It is the following of normative rules which alone gives meaning and significance to our actions -- meaning is not endowed by any mental acts or states accompanying them. For Winch the case is much as Wittgenstein pointed out; it is our ability to be similarly trained in rule-governed behaviour which allows even the possibility of participating in, and thereby explaining, socially meaningful transactions. The special problem that Winch sets for himself is not so much that of understanding a member from one's own community, but rather, understanding the actions of the participants of a culture with a conceptual structure far removed from one's own. The classic case is the modern anthropologist confronted by the activities of a primitive culture. How does the anthropologist interpret and understand the behaviour of a culture which lives and thinks in a way totally foreign to his? How would he even know if and when he had understood? And by extension, how do we know when we have interpreted someone's behaviour even in our own culture correctly? Winch uses and develops Wittgenstein's insights in an attempt to answer such questions.

First Winch sets out to prove, in a Wittgensteinian way, that meaningful behaviour is indeed necessarily social and rule-governed. This follows from the simple observation that we can either adhere to or contravene the rules governing such behaviour. Consequently, for one to learn how to apply a rule correctly is to be shown how to obey it by other members of a community -- to be corrected by them when we have contravened it,

and to be encouraged by them when we have applied it correctly.<sup>12</sup>

[O]ne has to take account not only of the actions of the person whose behaviour is in question as a candidate for the category of rule-following, but also the *reactions of other people* to what he does. More specifically, it is only in a situation in which it makes sense to suppose that somebody else could in principle discover the rule which I am following that I can intelligibly be said to follow a rule at all.

Learning cannot take place in a so-called 'wild children' situation (e.g. the 'Wild Boy of Aveyron'), as some might think. Rules are **essentially** connected to social situations. It does not make sense to think of one person in isolation learning and obeying a rule, for there would be no objective standard of correctness.

From the **essential** rather than **contingent** connection of rules with social situations arises the most important conclusion of this dissertation: **it follows from the conceptual inseparability of a piece of behaviour from its social context that the antecedent conditions of that behaviour cannot be its cause(s)**. Think back for a moment. The whole point of Chapters One and Two was to show how crucial it is for a causal explanation that an event and its cause be conceptually distinct, a middle premise being required to deduce an event from its cause. If this logical requirement is not met, the event to be explained cannot be caused by its temporal antecedents and therefore scientific explanations cannot logically apply to the event in question (keep in mind here Hempel and Oppenheimer's logical conditions for causal explanation). In particular, as meaningful behaviour cannot be divorced from its social context, the context that that behaviour arises in cannot possibly be the

cause of it -- the whole idea of meaningful behaviour being caused is logically incoherent, and so too the whole idea of causally explaining meaningful behaviour. Without realising that a human action is conceptually related to its social context (or even worse, by deliberately ignoring it) the philosophical tradition in the earlier chapters mistakenly prised it out of that context by attempting to explain it with the insertion of a middle premise rather than a conceptually related setting. To the extent that social contexts and social rules are essentially related to meaningful behaviour, then to that extent the methods of natural science simply do not apply.

### The Logical Differences between the Natural and Social Sciences

To better appreciate the radical implications of this claim, we must see how the notion of 'criteria' applies very differently indeed in the natural and social sciences. This will require careful development.

First start with their similarity.<sup>13</sup>

A regularity or uniformity is the constant recurrence of the same kind of event on the same kind of occasion; hence statements of uniformities presuppose judgements of identity. But ... criteria of identity are necessarily relative to some rule: with the corollary that two events which count as qualitatively similar from the point of view of one rule would count as different from the point of view of another. So to investigate the type of regularity studied in a given kind of enquiry is to examine the nature of the rule according to which judgements of identity are made in that enquiry. Such judgements are intelligible only relatively to a given mode of human behaviour, governed by its own rules.

The key words here are 'same' and 'identity'. What counts as one event being the **same** as another event on a different occasion?

It is for just this type of problem that Wittgenstein's technical

notion of 'criteria' is invaluable. Science, like any other shared activity, is rule-governed, and it is the rules established by the agreement of the participants concerned that provide the criteria of identity for picking out the phenomena relevant to their interests. Indeed, if there were no such agreement, there would be no scientific activity. However, and this is the crux, there is not just one but **two** sets of relations which an individual scientist must consciously or unconsciously take into account when going about his business: (1) his relation to the phenomena he is investigating, and (2) his relation to the scientific community.<sup>14</sup> The philosophies discussed in Chapters One and Two have traditionally emphasised the former and all but ignored the latter. They never take into account the fact that the rules governing what counts as 'an X', much less as 'observing an X', and thereby enabling the scientist to pick out what counts as relevant to his enquiries, are for the most part provided by the **second** set of relations; indeed, there is no other place they could come from. That is, natural phenomena cannot provide criteria of identity for themselves, **they must be imposed onto such phenomena from without**. The 'facts' in the first group to which the scientist is related are dependent upon the conventions decided upon by the group of which he is a member; that is, in opposition to the empiricists, there are no 'brute' or 'theory-free' facts. (The point being made here should not be confused with Popper's 'searchlight' theory, which is quite different. For Popper the facts are already there -- independent, discrete, and objective -- all that is required is a problem to act as a 'searchlight' to pick out those facts relevant to that problem. For a Wittgensteinian/Winchian

philosophy of science, on the other hand, those very facts are constituted by the concepts we impose upon them. There are, then, no objective brute facts waiting to be picked out from their background.) This means that a new scientist must be trained by the others in the use of the concepts that the particular activity of science employs in just the same way as one learns any other type of activity. Until he can employ the concepts of his discipline automatically, he remains a learner only. (This is not to say, of course, that he must be able to articulate these rules in order to understand them, for that activity is of a second-order nature.) The deductive nature of scientific explanation traditionally offered by the empiricists can be quite readily modified to accommodate this account of rule-governed behaviour when it is acknowledged that generalisations rely on criteria (see page 117-8 below).

Winch's account of science does not stop there however, for it is at just this point that the radical differences in the logic of explanation in the natural and social sciences become most obvious. Whereas the rules governing criteria of identity in the natural sciences must come from the second group of relations, in the social sciences they must ultimately come from the first. Consequently, social scientists cannot provide their own criteria of identity for actions. Unlike the phenomena studied by the natural scientists, their **subject matter** alone must provide such criteria. The subject matter of social science is social behaviour, i.e. behaviour according to certain conventional rules -- let us call these 'first-order' rules. Now, Winch insists, it is these first-order rules which establish the criteria for what constitutes a social fact, and not at all

the rules of the scientific community as is the case in the natural sciences. The social scientists must base the rules of their discipline upon the first-order rules which constitute the very behaviour they are studying. These second-order rules, parasitic upon the first-order rules, provide the social scientist with the intellectual tools necessary to study and explain to his colleagues the social facts belonging to another community. If this were not the case, i.e. if social science were to be governed primarily by its own conventions as in the natural sciences, then the social scientist could not even identify what it was that he was trying to explain, a necessary preliminary for an explanation of any type. After all, if he imposed the concepts of his own community onto the one he was studying, then he would be mis-identifying and therefore mis-describing precisely the social action he was interested in. This because the concepts he would be using would be conceptually related to his own social context, while the social context he is studying would not be that one but some other constituted by its own rules. Accordingly it would be simply absurd to give reasons for an agent's behaviour using concepts that were totally foreign to him, for they would not be the ones constituting his own behaviour. This fleshes out the main point, that understanding social behaviour does not and indeed cannot consist in giving a causal account of it, but in grasping the rule by which the behaviour of the culture being studied is governed or constituted. Hence the phrase 'reflective understanding presupposes pre-reflective understanding'. That is, when we are trained in a new skill, we most often learn it without the rule governing the activity being precisely stated. We do what we are

taught to do pre-reflectively. Since this is so everywhere, anthropologists have a most difficult double-barrelled task. They must be able to formulate explicitly the pre-reflective first-order rules governing the actions they are studying. And they must do this prior to establishing their own second-order rules upon which to base their study. Winch provides a very nice example from economics in which the distinction between first and second-order rules is made obvious.<sup>15</sup>

[L]iquidity preference is a technical concept of economics: it is not generally used by business men in the conduct of their affairs but by the economist who wishes to *explain* the nature and consequences of certain kinds of business behaviour. But it is logically tied to concepts which do enter into business activity, for its use by the economist presupposes his understanding of what it is to conduct a business, which in turn involves an understanding of such business concepts as money, profit, cost, risk, etc. It is only the relation between his account and these concepts which makes it an account of economic activity as opposed, say, to a piece of theology.

In giving an explanation of the behaviour of a foreign culture, the anthropologist must likewise ultimately resort not to the concepts belonging to his own discipline, but to those belonging to the culture he is studying.<sup>16</sup>

### Some Consequences

It is profitable at this point to reconsider how very differently the criterion/symptom distinction has to work in the natural and social sciences. Although Winch does not discuss what follows, it is I think implied in his conclusion that the social sciences are doubly rule-governed.

In the phenomena studied by natural science, much of the traditional story remains. The causes of any given event are conceptually distinct from it. That is, an antecedent event is a

mere symptom or sign of the event to be explained. From such a contingent relation we can draw correlations which may guide further research. The question must be asked of where the criteria of identity for both the event and its cause(s) come from? Winch has indeed pointed out that they are provided by the conventions of the scientific community. But what he did not say was that they are an integral part of the same natural laws that constitute the middle premises by which we can deduce the event E from the antecedent conditions. The laws, models, hypotheses, theories, or whatever incorporated in the explanans are package-deals; they provide both the conceptual apparatus by which we can identify phenomena and the means by which we can deduce an event from its causes. If the criteria of identity were not included, then it would be logically impossible to identify the facts subsumed under these laws. Indeed, it is just this package-deal feature of the theoretical part of science which allows us to retain the Humean notion of a contingent causal relation whilst introducing the modern 'no theory-free facts' modification which has become so well-known since Kuhn and Feyerabend. The human element of natural science -- the conventional criteria of identification -- cannot be ignored. The objection that scientists do not consciously incorporate any such criteria into their laws is easily countered, for in just the same way as we apply concepts pre-reflectively in our everyday language, so too do the scientists apply the concepts of their discipline in the way they were trained without reflecting on their explicit formulation -- it is only by standing back and reflecting on rule-governed behaviour that we can formulate and articulate the rules underlying it.

The same point regarding the conceptual distinction of causal events even within this new way of things can be put differently perhaps. If the event X is a symptom for the event Y, then the events X and Y are both **independently identifiable**. Their criteria of identity are logically distinct even though they may be contained in the **same** theory or model that provides the natural laws for the deduction of the event Y from X. That the events are indeed independently identifiable can be shown by noting the historical fact that prior to them being subsumed under the same theory, their criteria of identity may well have been in existence independently of each other. This has often happened in the history of science when theories of a more general nature encompass less general theories which had not previously been related in any way; for example, Newton's Laws encompassed all of Kepler's Laws, the workings of the tides, and the falling of objects near the surface of the earth, even though the relations between these phenomena had not been noted prior to them being subsumed under the same theory.

On the other hand, if in a law of the form 'all Y's are X's' X was indeed a criterion of identity for Y, then X and Y would **not** be independently identifiable, i.e. we would learn Y through X and hence would not **discover** that they were in some way related because we would know *a priori*. In this case X and Y would be connected by conceptual meanings, not by contingent correlations. But this is just the case in the social sciences where the antecedent events or circumstances themselves are the criteria of the event to be explained, and not merely a symptom or sign of their occurrence. In the social sciences, that is, the antecedents of any social event are **conceptually** related to it.

It is for this reason that no scientific theory or covering law is required to explain meaningful social behaviour, and indeed, such a theory or law is logically prohibited. To be sure, some of the symptoms of human behaviour can be explained in terms of antecedent causes. For example, a neuro-physiological process which is a symptom of pain can be causally explained by attempting to establish those events in the central nervous system which are its causal antecedents. But this is **not** to say that the behaviour for which these processes in the central nervous system are symptoms can itself be explained causally by these same events. It makes no sense to say that such behaviour is caused -- its connection with its circumstances is of a wholly different order.

The differences between the natural and social sciences with respect to the symptom/criterion distinction can be summarized by the following schema.

NATURAL SCIENCE

C1,C2,---,Ck

L1,L2,---,Ln

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E (natural event)

SOCIAL SCIENCE

C1,C2,---,Ck

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E (social action)

C(1-k) are the causal antecedents (symptoms or signs) of E. L(1-n) provide; (1) the criteria of identity for both of these conceptually distinct groups, and (2) the means of deducing the latter from the former.

C(1-k) are the social contexts by which the presence of E is justified according to criteria provided by the conventions of a community. No criteria can be imposed onto this type of phenomena from the outside as it is in the natural sciences. Hence to grasp the rule governing E just is to understand the action.

If understanding meaningful behaviour consists of grasping a rule, then it follows that we can never understand an action through statistical techniques alone. To establish a *de facto* correlation from symptoms and to then devise a testable hypothesis of the form 'all A's are B's' or '75% of A's are B's' is to miss the point or significance of the action entirely.<sup>17</sup>

The difference is precisely analogous to that between being able to formulate statistical laws about the likely occurrences of words in a language and being able to understand what was being *said* by someone who spoke the language. The latter can never be reduced to the former; a man who understands Chinese is not a man who has a firm grasp of the statistical probabilities for the occurrence of the various words in the Chinese language.... 'Understanding', in situations like this, is grasping the *point* or *meaning* of what is being done or said. This is a notion far removed from the world of statistics and causal laws: it is closer to the realm of discourse and to the internal relations that link the parts of a realm of discourse.

We may indeed make a hypothesis and find that predictions derived from it fail to be falsified, but this does not mean that the action has been **understood**. It is because rules are normative and not deterministic that there is no logical contradiction involved in predicting an action X on the basis of antecedent conditions and *de facto* rules, and then find that X did not occur. Some empiricists try to escape this fact by attempting to predict classes of events rather than singular events on the basis of 'very typical' antecedent conditions. We can in principle, so they claim, test these hypothetical typical conditions by deducing classes of events from them to see whether in fact they do or do not obtain. The justification for this procedure is that social phenomena are 'so much more complex' than natural phenomena, and as statistics deals with classes of events rather than singular events then it can be readily used to

avoid these annoying anomalies. The key point is that according to the empiricist tradition of Chapters One and Two, such anomalies are due solely to our ignorance of all the relevant causal factors because of the extreme complexity of the subject matter. It is not due, as it is for the new Wittgensteinian tradition Winch is developing, to the subject matter being qualitatively different and therefore requiring a different logical type of explanation. And surely on this point Winch and company are right. In natural science the deductive schema

$$C_1, C_2, \dots, C_k$$

$$L_1, L_2, \dots, L_n$$

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$$E$$

allows us to make a testable prediction E on the basis of antecedent conditions and hypothetical laws. If the prediction E is falsified, it follows from the logic of the schema that at least one of the statements describing the hypothetical antecedent conditions in C(1-k) and/or at least one of the hypothetical general laws contained in L(1-n) must be rejected. It is this very feature that Popper takes as his Principle of Demarcation of science from pseudo-science. There is no dispute between the empiricist and Wittgensteinian traditions that this is true for natural events subsumed under the empirical laws of nature. Meaningful behaviour, however, is governed by normative rules and identified by criteria derived from these same rules, and there is no logical contradiction whatsoever involved in affirming the presence of the criteria for an event X and denying that an X has actually taken place. There may have been relevant

circumstances that were not taken into account, or we may be confronted with a novel situation in which a decision has to be made upon the applicability of a concept to this new situation (a situation which often occurs in legal matters). So whilst natural science must reject a falsified hypothesis on pain of committing a logical contradiction, no such rejection takes place in the social sciences because there is no logical contradiction involved -- the logic works differently. The empiricists are right to say that social activity is much more complex than natural phenomena. But they are not right to say this is due to a difference in degree, it is due to a difference in type.

Another more fundamental and obvious reason why the logic of explanation is different in the natural and social sciences is because in the end my behaviour comes to **my choosing** to follow a rule. This is the whole point of distinguishing normative from deterministic rules (where in the latter the whole notion of choice is wholly inappropriate, for only constant conjunctions apply). When I play chess I must do so according to the rules of chess (otherwise I would not be playing chess but merely moving objects around on a board); however, I need not play the game in the first place. Similarly, if I vote I must do so according to the rules of the democracy to which I belong, otherwise the vote is invalid and not counted; but still I can choose not to vote in the first place (the further ethical question of whether I should choose not to vote is another matter). Action which is symbolic or meaningful is due to a **commitment** on the part of the agent to behave in one way rather than another (the commitment involved in keeping a promise is an excellent example of this). No matter of statistics could ever capture the values and commitment involved

in such an act with a *de facto* description. This does not mean that statistics has no useful part to play in, say, economic or town planning, for obviously it does, but it does mean that explanation and understanding cannot be reduced to such methods. For they leave out precisely that aspect of human behaviour (i.e. choosing to follow a normative rule) which is so different from the natural events that statistics is so appropriate for describing (correlations of events).

I think enough has been said to show that the natural and social sciences end up two very different disciplines for Winch. Natural science is interested in establishing causal links between phenomena. Social science is interested in understanding meaningful behaviour. The social scientists who despair over ever being able to model their methods on those of the natural scientists are right to realize they will never succeed, no matter how sophisticated their techniques become; but they are wrong to despair over that fact, for it is no flaw or shortcoming but precisely the conceptual difference between those sciences.

### III. SEARLE'S SPEECH ACTS

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John Searle was very much influenced by Austin's theory of performatives. According to this theory, linguistic activity consists of intentional actions in which words are used to carry out socially meaningful transactions. This insight prompted Searle to give an **internal** account of language, that is, from the point of view of a member of a linguistic community who participates in such behaviour himself. It is his hypothesis that speaking a language is a form of rule-governed intentional behaviour.

If Searle, along with Wittgenstein and Winch, is correct in his claim that language is a rule-governed form of behaviour, then this would account for the regularities it displays. Such an account of language is directly opposed to the theories which attempt to explain language **externally** (the behaviourist psychologist B.F. Skinner is a classic representative of such theories). The mark of this latter type of explanation is a detached observer noting regularities in phenomena from without. In the case of language the observer notes the typical circumstances (the stimulus) associated with the utterance of a particular word (the response) and draws a correlation between them. From *de facto* descriptions of regularities the observer codifies laws, general principles, or rules of thumb which can be used to predict the likelihood of a person uttering a certain word given the occurrence of the appropriate stimulus. This knowledge can be put to good use teaching children how to become competent speakers, for with the repetition of appropriate stimuli and manipulation -- setting examples, rewarding, punishing, etc. -- the child will soon learn to associate the

correct word with its stimulus. From such observations the behaviourists typically conclude that the meaning of a word just is the stimulus which triggers it. These theories thereby assume that the agent is a passive object stimulated by outside events; i.e. all behaviour, including language, is explained in terms of what **happens** to the agent from without, and hence words such as 'prodding', 'conditioning', 'rewarding', and 'deprivation' are used to causally explain an organism's behaviour. Human beings then, are just sign-noting and sign-emitting organisms as are other organisms, not at all set apart by any normative rule-following capacities.

It is exactly this external point of view Searle wishes to dispute, for in giving such a behaviourist account of linguistic behaviour these theories ignore entirely the all-important contribution of the agent. According to Searle we do not utter a word as a response to a particular stimulus, rather we **use** or manipulate words and symbols to perform certain actions -- actions that we **do** for some reason or purpose. These actions are not pieces of behaviour which result from something which **happens** to us from without and governed by deterministic laws of nature.

### Rules and Facts

The point which needs to be developed to justify this thesis was initially made by Austin. More accurately, it is a distinction between two types of normative rules -- 'regulative' and 'constitutive' rules. There are several key differences between them.

(1) Firstly, constitutive rules **create** the very possibility of new forms of social behaviour, and therefore are logically

prior to that behaviour. I cannot perform the action of voting, for instance, if the rules governing the institution of voting are not there in the first place. Similarly, I cannot obey an order unless the institutions of ordering and obeying are there for us to learn, understand, and be committed to. The subject matter of the natural and social sciences are very different in this respect. For while no-one ever obeyed an order before the relevant institutions were present there were thunderstorms prior to the theories that explained them (Winch's example). That is, social events cannot take place without normative constitutive rules, whilst natural events can and do take place without any such rules (although, of course, the scientist's description and explanation of them cannot take place without the equally constitutive rules that make the activity of science possible).

It goes without saying that the type of behaviour created by constitutive rules excludes such forms of behaviour as reflex actions -- these do indeed belong to the subject matter of the natural sciences as they result from antecedent causes, not normative constitutive rules. It is quite obvious why meaningful behaviour cannot be included in this category, i.e. a description of this type of action could only consist of *de facto* descriptions of space-time co-ordinates, and they miss out the very point of meaningful behaviour because they do not include the rule-governed element.

Regulative rules, in contrast to constitutive rules, regulate **already existing** behaviour. Take, for instance, the rule 'don't drink a whole bottle of gin if you want to function properly the next day'. The possibility of refraining from overdrinking is not created by such a rule of conduct, but is

presupposed by it. These rules often take the imperative form

'if Y then do (or don't) X'.

(2) Constitutive rules are also logically necessary to **define** the behaviour they constitute. Definitions of such behaviour take the form -- as opposed to the imperative form of regulative rules -- 'Y counts as X in context C'. For instance, the act of castling in a game of chess just **is** moving your king and castle in the appropriate rule-governed ways in the back row (Y) when the right circumstances obtain (C). Regulative rules by contrast are not necessary to actually define the behaviour which they prescribe because that form of behaviour is already set aside and in existence, and hence able to be defined and described before the rule prescribing such behaviour as regulative or binding or obligatory come into existence. It follows, then, that constitutive rules provide the logical specification or classification by which an action is categorized. Searle exploits the definitive nature of constitutive rules to good effect when codifying the rules that govern meaningful behaviour. (The point made here in (2) does not conflict with Wittgenstein's technical notion of criteria, for criteria of identification are presupposed in any description, regardless of whether the behaviour is regulated or constituted by a rule; for instance, my holding my fork in the left hand as opposed to the right presupposes criteria of identity for the correct application of the words 'holding' and 'right', but for all that the rule that I ought to hold my fork in my left hand is a regulative rule.)

(3) Another distinction that goes with the constitutive/regulative distinction and is really but a development of it is

the distinction between so-called 'brute facts' and 'institutional facts'. The former are the facts the empirical sciences have traditionally taken to be the very basis of the world. The subject matter of the natural sciences is thus the entire collection of these brute facts (even though they are not, as we have seen, free from theory and are actually constituted by the criteria incorporated in the theories and models of science). But contrasted with such facts are what Searle calls 'institutional facts', e.g. getting married, being convicted in court, exceeding the speed limit, making promises, buying a book, casting a vote, and so on. These cannot be reduced to brute facts, for they are constituted according to certain conventional or normative social rules. Whilst both brute facts and institutional facts are constituted by rules, the former is constituted by rules imposed onto phenomena from without, whilst institutional facts are constituted from within a community by human beings carrying out intentional rule-governed acts.<sup>18</sup>

[T]heir existence, unlike the existence of brute facts, presupposes the existence of certain human institutions. It is only given the institution of marriage that certain forms of behaviour constitute Mr Smith's marrying Miss Jones. ... These "institutions" are systems of constitutive rules. Every institutional fact is underlain by a (system of) rule(s) of the form "X counts as Y in context C".

My buying something does not consist in my hand passing pieces of paper to another human being whilst he passes an object back to me (even the concept of 'passing' cannot be reduced to brute facts); currency notes are not just bits of paper (which is why counterfeit is never money, no matter how 'real' it looks, for there is a certain institutional background missing which is logically necessary for any currency to be valid). Likewise, me

saying something cannot be reduced to *de facto* sequences of noises and grunts.

In general, though rule-governed behaviour manifests itself in observable regularities, it can never be reduced to the *de facto* laws the empiricists would like to establish from their observations. My castling in the middle stage of a game of chess, for example, cannot be reduced to *de facto* statistical regularities. For the following of a rule which creates new behaviour and is specified in terms of that rule is conceptually linked to the context that it arises in. That is, 'Y counts as X in context C' means that X cannot be conceptually divorced from Y and C, and this means that a merely empirical correlation of the form 'whenever X has been observed, so too has a Y and a C' is not possible. A correlation must be of events which are conceptually distinct, otherwise it is pointless -- compare the statement 'every triangle so far observed has had three sides'. Whilst it is true that regularities can be observed in social behaviour, these regularities cannot be said to be reduced to *de facto* descriptions of them, and in fact the drawing of such correlations amounts to making mere tautologies. It is this confusion that has led science to misunderstand the logic of explaining social events.

To derive the actual rules that constitute a piece of social behaviour, Searle works backwards from the definition 'Y counts as X in context C' to first establish the necessary and sufficient conditions (Y and C) for a constituted action X to have been successfully performed (e.g. voting or promising). These conditions are not reducible, remember, to brute facts, but to a combination of other institutional facts and actions of

lesser complexity. Once these necessary and sufficient conditions have been established they are then incorporated into the formal constitutive rules that govern the institutional fact X.

### Summary

In this chapter I have shown by pointing out the importance of rules how the logic of explanation in the social sciences differs from that in the natural sciences. Wittgenstein, Winch, and Searle each have a different flavour to their conceptions of social action, but what is central to each of them is the rule-governed nature of meaningful behaviour. It is this feature that distinguishes these philosophies from the causal explanation/brute fact tradition of empiricism. In the following chapter I hope to draw out the implications of this radical difference when it comes to the actual practice of explaining meaningful behaviour in the study of social science. In particular, I wish to show how the Rationality Principle has some very serious defects when it is considered in light of the points made in this chapter.

CHAPTER FOUR  
THE RATIONALITY PRINCIPLE REVISITED

## I. SOME REMINDERS

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In Chapter Two we saw how Popper attempted to explain human behaviour by reconstructing the agent's objective problem situation and his response to it. The statements describing (1) the problem situation, and (2) the trivial general law that rational human beings act more or less appropriately to a given problem situation, allow us to deduce and thereby explain the behaviour in question. This type of explanation initially appears plausible and tempting because it takes into account the especially human elements, i.e. the agent's aims and beliefs. Hume and Mill, by contrast, offered an account of human behaviour in terms of allegedly universal psychological laws of human nature, giving it all a distinct and unlikely ring of determinism. Popper at least discusses the aims and beliefs of individuals. All of these factors are, of course, to be described in world 3 terms, such descriptions being true if and only if they correspond to the facts as they really are in worlds 1 and 2. As I indicated earlier, I wish to argue now that Popper is partly right but also partly wrong. He is definitely right in appealing to an individual's aims, motives, reasons, and beliefs. But he is definitely wrong in saying (1) that the Rationality Principle uses a general law as a middle premise; (2) that such explanations can be given in objective world 3 terms; and (3) that the Rationality Principle can account for all types of human behaviour.

In the previous chapter I showed that according to one philosophical tradition the explanation for any given action really consists in making clear how it fits into its context by giving reasons for it. It is important to realize that

explanations by reasons are not at all what Popper wants.

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For a start, such an explanation is not a causal one.

Consider the question 'why did you rob the bank?'. There are three acceptable types of answer which could be offered to this question (by 'acceptable' I mean to make the action understandable, not to excuse it).

- (1) 'I was broke and owed money.'
- (2) 'Robbing a bank is a quick way to get money.'
- (3) 'I wanted to clear my debts quickly.'

(1) is the agent's belief about his problem situation, and (2) is another belief as to the solution of that problem to achieve the aim stated in (3). The criteria of identity for an agent being rational is for him to be able to calculate on the basis of his beliefs how he can best achieve his wants given the relevant circumstances, the action he decides upon being instrumental to achieving those wants. Now what does the concept of 'wanting' amount to here? The following seems to come close; an agent who wants X is prepared to take steps Y he believes are necessary to satisfy X. In giving reasons for doing Y then, all the agent need do is specify (a) that he wanted X, and (b) that as a result of deliberation -- which, of course, takes into account the relevant beliefs and aims included in his problem situation -- he believed the action Y would achieve X for him. To give (a) and (b) just is to give the reasons for the action Y, and furthermore to give such reasons is to explain that action. But notice that there is a conceptual relation between the agent's wants, beliefs, and actions. The concept 'wanting X' just means, among other things, that the agent will take the steps Y he believes

necessary to satisfy X. It just does not make sense, then, to say that wants and beliefs are the causes of actions.

The distinctiveness of 'giving reasons' as an analysis of 'giving an explanation' does not stop there. For it must now be considered how the agent **decides** that Y is the best means of achieving X given his situation. This involves the concept of rules we spent so much time on in the last chapter, in this case rules of deliberation and calculation, and rules even of what counts as relevant to X for a deduction to Y. After all, making decisions in general is possible only if the agent has **learnt** the rules of calculation and the criteria of identity for what counts as relevant and important to those calculations. The appropriateness of the action, given the beliefs and aims of the agent, is justified by the criteria governed by the conventional rules of deliberation and calculation the agent has learnt to apply in his social environment. Thus to the question 'why have you chosen to live in Wellington rather than Palmerston North?' the answer 'I've got a job down there' could well be a reason, and the reason is acceptable (understood as a reason at all) and rational only in virtue of our accepted norms of rationality. It is through such norms that we can describe a reason as a good or a bad one. Problem solving is through and through a skill that is learnt in a social context, and can never be divorced from it. Accordingly, in recalling the steps of a calculation that we went through upon being asked our reasons for doing an action Y, we cannot then call that calculation a cause of Y, not even a partial cause of Y, for the calculations are conceptually linked to that action.

I wish to make a final point about explanations by giving

~~reasons, one which concerns the general notion of classification.~~

'What are you doing?' asks the learner as I swap the positions of the King and the Rook in the back row of the chess board in the middle of a chess game. 'That's called castling, and can only be done in conditions x, y, and z. It is most useful for defence purposes in the middle game.' Even in classifying my action (as 'castling') I have given the reason for performing it ('it is defensive'). And this is nothing accidental or dispensable. The whole point of castling is to enhance my defence when the occasion calls for it. Hence, to classify such an action just is to provide the motive for it and therefore to explain it. 'What are you doing?' can also be asked in less artificial situations, such as when I take my suit out of the wardrobe -- 'I've got a job interview tomorrow, remember?' The reason for my getting my suit out of the wardrobe was explained by reference to an interview -- I have classified that particular action under the sorts of things that go to make up the actions surrounding an interview. For the 'reasons are really just causes' tradition that Popper is perpetuating from Hume, Mill, and Hempel, there is a conceptual separation between interviews (cause) and what I do preparing for them (effects). And yet in truth this conceptual separation is not something which can ever be brought about. Actions and our reasons for them are bound together with the glue of social norms and standards, and can never be separated.

A demand for an explanation of some action usually comes about from not knowing which concept the behaviour in question comes under. Hence it is only by knowing the grammar of the appropriate behavioural concepts -- knowing the criteria of identity for that particular concept, i.e. knowing the social

contexts in which it applies -- that reasons can ever be offered and understood. In other words, to know one's way about with these concepts presupposes being a competent rule-following member of a linguistic community. Giving reasons therefore requires that both myself and the person to whom I am offering them understand the linguistic rules governing these concepts. It follows that explanation of behaviour consists of making explicit the underlying constitutive rules governing such behaviour, not by giving causes.

## II. CAN THE RATIONALITY PRINCIPLE BE A MIDDLE PREMISE?

Enough general reminders about explaining by giving reasons. They have sufficed to show that the results of Chapter Three have a direct bearing on each of the three theses to which Popper is especially wedded with his world 3 Rationality Principle explanation for human behaviour (page 132 above).

Popper claims that the statement 'rational human beings will choose the most appropriate means to fulfill their aims' is, indeed must be, a testable empirical hypothesis. All intellectually respectable explanations must consist of the deduction of a statement describing a particular event from other statements describing (1) the relevant antecedent circumstances, and (2) at least one general law. The middle premise contained in (2) must necessarily be an empirical statement. Popper (and Hempel as well) makes noises about such empirical statements being trivial and probably false anyway (or being part of an explanation sketch only) but the point remains -- for him it must be an empirical hypothesis. But this cannot be, for in the end the statement of the Rationality Principle must amount to the

following.<sup>1</sup>

[A]ny rational person acts in accordance with his ideas and beliefs. Now that is clearly not a law at all, but a tautology, or a *definition* of a rational person. Hence we understand why the 'laws' which Hempel's model requires seem so trivial and are so often taken for granted. It is because they are not laws at all, but simply masked tautologies or definitions.

To say a rational person acts in accordance with what he perceives to be the case is not to say anything of empirical significance at all, but only to say something about how the grammar of our language works, i.e. to show the logical geography of concepts, to make obvious their connections to each other. It follows that the explanation of actions by situational analysis in the Hempel/Popper manner has no empirical content at all, and certainly cannot be deductive if by that it is meant an action and the situation which it arises in require a middle premise to be linked.

### III. CAN 'RATIONALITY' IN THE RATIONALITY PRINCIPLE BE A WORLD 3 MATTER?

For any given linguistic community there are sets of underlying rules by which all its forms of behaviour are classified. If one community possesses different concepts to another, then *ipso facto* its rules and classificational categories will be different also. What counts as the doing of X in one community may not consist of anything in particular in some other community (that is, it will be neither an X nor a non-X, the terms just do not apply). This follows because the latter community does not have the concept by which X versus non-X can be classified/constituted/individuated.

~~All this applies just as much to the subject of rationality~~  
and to the Rationality Principle itself. What are the criteria of identity for a problem? For aims and goals? For true as opposed to false beliefs? For rational as opposed to insane or irrational behaviour? In answer to these questions consider the following examples. I cannot aim to pass an exam unless the institutions of examinations, assessment procedures, educational establishments, and learning, were present in my community to begin with; and so too, of course, the appropriate means to this end. Likewise, the Azande witchdoctor cannot go through the procedures of establishing who the witch responsible for a mishap is without the rules and criteria governing these procedures, he must know what counts as an answer, and what counts as a double-check for that first answer, and so on. That is, the aims and beliefs I can have depend upon the meaningful activities constituted by the rules of my community. If that is the case, then rational behaviour depends upon these rules also (due to the conceptual relations between aims, beliefs, and rational behaviour). Furthermore if what counts as rational behaviour in one system of concepts will not so count in another, then it follows that to the extent that goals, aims, and beliefs are culture bound, to that extent too is the very idea of rationality. For in just the same way as criteria of identity are relative to the group that creates them, then so too are the criteria of identity for what counts as rational behaviour. The whole concept of rationality does not make sense until it is made obvious **whose** criteria of rationality we are talking about. Rational behaviour, then, is not behaviour which is in accord with how things 'really are' in some 'objective', (i.e. non-

relative) world.

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This feature of rationality opposes Popper's 'zero method' -- the notion here being that there is one ideal rational action which the agent could in principle perform that would be most likely to achieve his aims given the logic of the situation, and furthermore this is an **objective fact** that is describable in world 3 terms. Given the objective world 3 description of the logic of the problem situation, there is in reality, Popper insists, some one action that will be the most likely to achieve that aim, and to perform that particular action would be an exemplar of perfect rationality. This exemplar is never in actual fact achieved in worlds 1 and 2, Popper admits, but only aspired to as an ideal; yet he does say it actually exists (in world 3) and can be approximated, with the real (world 3) rationality of the action measured accordingly.

Against that entire view, I am arguing that rationality must be decided upon from **within** the criteria of a particular community. No detached observer can ever use criteria from his own community to judge the rationality of actions performed by others in a community which possesses concepts different to his. He must grasp the rules by which these actions are constituted and decide on the basis of those whether the behaviour is (relative to them) rational. To judge another culture externally by one's own criteria of rationality is to commit a category-mistake -- that is, to classify an action under a concept which is logically inappropriate. Only culture X rationality is appropriate in any explanation of behaviour.

In this spirit, the anthropologist for instance has to extend his stock of concepts to encompass those of the community

he is studying rather than force their concepts to conform to his own. It is only by such an extension of concepts that the anthropologist can make obvious the conceptual structures possessed by the culture he is studying and thereby make it possible to explain (by giving reasons) the behaviour of that culture to his own.

The relativity of criteria of rationality has for too long been ignored, or even worse, has just been paid lip service to. The imposition of one's own criteria onto the actions of another community is actually paramount to denying the rationality of others' actions just because they are different. We were supposed to have learnt from Evans-Pritchard that such an attitude is not just wrong as a matter of fact, but is a logical blunder. We may indeed announce publicly that rationality is nothing objective, but by being part of a culture that is so spellbound by the achievements of science and technology, we privately think 'of course their beliefs are totally unfounded, there are no witches'. By doing so we are assuming that our concepts are the only ones which correspond to objective reality as it 'really is' -- covertly projecting them onto world 3 as the 'real' ones. In short, we are all Popperians in thinking that the activity of science is the most rational and objective of all activities. To possess such a belief is to ignore the advances made in both anthropology and philosophy in the twentieth century. We cannot, in all intellectual honesty, ignore the stage-setting within which the rules governing criteria of identity are agreed upon.

To suppose that there is indeed an objective reality for which Western science is the best candidate for discovering and

describing, is to cast doubt on the Rationality Principle as Popper uses it in yet another way. He tried to distinguish between the problem situation as it was perceived by the agent and the problem situation as it 'really was'. But this he cannot do if by the latter is meant the world as it is independently of conventions (i.e. in terms of world 3 objects only). If the agent perceives the situation correctly according to the conventional criteria of identity agreed upon by his community, then that is all that can or need be said. This does not mean, of course, that the agent's beliefs are always correct, for indeed they may be false. But whether true or false, the belief must be judged so according to the criteria appropriate to the agent's (relative) context, not the observer's (world 3) context. It makes no logical sense to distinguish between the agent's perceived situation and the situation as it really was. The attempt by a scientist to reconstruct the objective problem situation in world 3 terms is then pointless. This because such a construction would be made according to the criteria used by the scientific community of which he is a member, and as these are logically inappropriate they would misdescribe the behaviour in question, and an explanation therefrom would not be an explanation of it at all. In the last part of this chapter, we will see how some western scholars have tried to do just this when attempting to explain the rituals observed in some primitive cultures. These activities have been described by such scholars as misguided and inadequate 'technologies' because they are not governed by the facts as they 'really are'. But the question should be asked, by whose criteria are these activities considered as technologies in the first place, let alone as

misguided ones? There are some important assumptions which must be questioned in this respect.

An attempt at describing objective reality is, as we have seen, not possible if by that is meant a true description of reality existing beyond our conventions, for what is real or unreal is decided upon by the agreement of the members of a particular community pursuing common interests. Hence it is not possible to compare others' beliefs with ours if there are different conventions involved. To re-iterate, the Rationality Principle is only applicable from within a set of concepts, not from without.

#### IV. CAN THE RATIONALITY PRINCIPLE BE APPLIED TO ALL BEHAVIOUR?

Consider now a related point. There are some words that must be used only in distinctly human contexts. This group of words would include the following verbs and adjectives; 'understanding', 'aims', 'intentions', 'rationality', 'pretend', 'deceive', 'lie', 'honest', 'calculate', 'deliberate', 'memorize', 'make mistakes', 'excuse oneself', 'promise', 'order', 'obey', and 'dread'. To apply these words to contexts outside of human contexts would be to make a category-mistake. Their proper use presupposes the appropriate background of training, learning, and grasping of rules (understanding). There are two problems associated with this group of behavioural words I wish to investigate here. Both involve Popper's stretching of the meaning of these words to such an extent that they are taken entirely out of the human contexts in which they originated. They then take on an illegitimate meaning which is often imposed

back onto human behaviour in a misleading way. It is due mainly to such stretching that logically inappropriate kinds of accounts of human behaviour are offered.

The first stretching consists in anthropomorphising such concepts onto animals and plants in such a way that a confusion results between bodily movements and behaviour. The second stretching consists of abstracting these same terms right out of human contexts so they become conceptually distinct from the behaviour originally described and explained. Each problem requires separate investigation.

### Anthropomorphism

The behaviour associated with words like the above examples must be separated from such forms of behaviour as aggression, migration, hibernation, primitive pain behaviour, blinking, and ducking. What is characteristic of these latter forms of behaviour is that, unlike the former group, they can and do take place without learning. They are all examples of purely instinctive behaviour which has its roots in hormones, seasonal changes, the central nervous system, and whatever other relevant physical causal factors there might be. This primitive type of behaviour is characterised, in other words, by its being **causal**. It is indeed therefore the proper domain of natural science, i.e. the search for testable antecedent conditions and general laws to explain such phenomena. The other group of behaviour, however, is characterised by its non-causal socially constituted nature, and by its not being able to take place outside of a linguistic community.

Popper may have been over-enthusiastic in following Jennings as far as attributing 'aims' and 'intentions' to unicellular organisms.<sup>2</sup> But he certainly intends to attribute the basic Rationality Principle schema to them, i.e. the schema involving such notions as 'problem solving' and 'rationality'. But in doing so he has taken concepts that are logically appropriate **only** to human beings and improperly applied them to unicellular organisms. Why has he? The answer was implicit in the previous chapter when discussing the difference in logic between explanations of (1) events in the natural world that can be subsumed under *de facto* general laws of nature, and (2) behaviour governed by normative rules; the latter is, whilst the former is not, strictly social bound. But all too often this second type of behaviour has not been taken account of in the appropriate way, and consequently all behaviour has been reduced to the first type. Popper and Jennings are no exceptions when they compare the regularities displayed in the jerky movements of an amoeba to the elimination of hypotheses in a scientist's trial and error method of overcoming problems, i.e. the framing of a hypothesis H1, falsifying it, eliminating the error, framing another better hypothesis H2, falsifying it, and so on according to the schema:

$$P1 \rightarrow TT \rightarrow EE \rightarrow P2$$

Hopefully, by such trial and error methods, both the amoeba and the scientist will eventually arrive at a close approximation to the truth. For the former it is a matter of the **organism's survival**, for the latter it means the **survival of a hypothesis**; that is, which things survive differs but not how or why or the principles of survival.

I cannot believe that this is a proper comparison to make

however. The amoeba, after all, is responding to a stimulus -- for example, a bright light, magnetic field, electric current, or an increase in temperature -- and it is doing so in just the same way that we would blink at a bright light, jump at an electric shock, or jerk our hand back from a hot stove (i.e. the causal forms of behaviour discussed above). By contrast the scientist's procedure, as we have seen, is possible **only** through the conventional criteria of identity tacitly agreed upon by him and his colleagues. Without such agreement there would be no such thing as the activity of science. What counts as a hypothesis, a falsification, error elimination, a problem -- all of these are what they are because of the conventions learned and taught by the members of a group who are bonded together by a similar interest. Amoeba, and of course, plants, can never form such conventions. Consequently, the behavioural terms which Popper applies to micro-organisms are logically inappropriate. His claims in this type of case do not make sense.

### Abstraction

Due to Popper's methodological individualism another important stretching of behavioural terms takes place. Institutions become abstractions existing only for the purpose of scientific explanation, and furthermore, they can only exist **after** the behaviour subsumed under them has occurred. Popper, quite properly, rejects the notion that institutions are essences lying behind and causing social actions. In its place he feels he must put a picture of a collection of atomistic individuals, the discrete atoms of a society, each acting more or less rationally throughout their problem solving lives. Similarities

in the behaviour of these individuals are then to be explained by using abstract models in the same way as natural scientists use models of atoms and molecules to explain similarities in the behaviour of, say, a certain chemical. In neither science, natural or social, are we committed to postulating an actual existence that such models represent (essentialism); they merely assist in explanations.

But this priority of individual behaviour over models of behaviour cannot be so, because the behaviour that these models set out to explain logically presupposes the very institutions which are supposedly abstracted out of this behaviour. Think of some examples; how could I obey an order before the institutions of ordering and obeying were present? How could I calculate the answer to an algebraic problem prior to the conventions (institutions) of mathematics? How could someone act rationally prior to the appropriate criteria of rationality? How could one keep a promise? Or win a game? These actions would not be possible without institutions -- they are conceptually linked to behaviour and cannot be divorced from it (remember Searle's 'X counts as Y in context C'). In short, it is in virtue of these conventions or institutions that individuals behave in the way that they do. Social behaviour is not possible without these rules, hence society simply cannot consist of discrete atoms whose actions are to be modelled by the postulation of social institutions. Without such institutions existing right at the beginning, there would be no behaviour for the social scientists to study in the first place. This truth, however, need not and does not imply any postulation of essences lying behind the behaviour under which they are classified. Popper has simply

over-reacted.

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Indeed, the over-reaction is much on a par with the over-reaction of anthropomorphism. The latter mistake consisted of imposing concepts which are appropriate only to human behaviour onto organisms which are not social beings. The former abstracts these same concepts out of the grass roots of social activity altogether. Both mistakes however, have identically the same source; i.e. a refusal to acknowledge that such concepts are **conceptually** linked to the behaviour that is classified under them.

#### V. A TEST CASE OF EXPLANATION IN SOCIAL SCIENCE: MAGIC

If the arguments in the previous sections of this chapter are correct, then the Rationality Principle should now be looking very suspect indeed. I want in this last section to test the Rationality Principle against a certain mode of behaviour, namely primitive magic and ritual.

The history of science, and social science in particular, provides many examples of attempts to show that primitive cultures possess a lower level of intellectual development than the Western scientific world. Once it was monotheism that was most often used to demarcate a primitive culture from a more rational one, polytheism being considered a sign of ignorance and superstition. Now science is most often used to perform this same function, for science, it is often claimed, is the very paradigm of rationality; whilst the activities of primitive cultures, particularly ritual and magic, are the very paradigm of irrationality.

Consider for a moment a classic in the history of anthropology. When James Frazer wrote The Golden Bough he had an enormous amount of material to work with. From this material he hoped to extract some common features of primitive myth and ritual and postulate these as necessary stepping stones for a culture's intellectual development (for Frazer the culmination of this development was manifested by the possession of a monotheistic religion and a competent and sophisticated science). In The Golden Bough he portrays magic as a pseudo-science, an activity arising from a set of false beliefs or hypotheses about how the world goes (note the similarity here to Hume's account of the origin of primitive religions resulting from a set of false empirical beliefs).<sup>3,4</sup>

- (1) [T]he principles of thought on which magic is based ... [are] two: first, that like produces like, or that an effect resembles its cause; and, second, that things which have once been in contact with each other continue to act on each other at a distance after the physical contact has been severed.... From the first of these principles ... the magician infers that he can produce any effect he desires merely by imitating it: from the second he infers that whatever he does to a material object will affect equally the person with whom the object was once in contact, whether it formed part of his body or not ... [T]he same principles which the magician applies in the practice of his art are implicitly believed by him to regulate the operations of inanimate nature; in other words, he tacitly assumes that the Laws ... are of universal application and are not limited to human actions. In short, magic is a spurious system of natural law as well as a fallacious guide of conduct; it is a false science as well as an abortive art. Regarded as a system of natural law, that is, as a statement of the rules which determine the sequence of events throughout the world, it may be called Theoretical Magic: regarded as a set of precepts which human beings observe in order to compass their ends, it may be called Practical Magic.
- (2) [R]eflection and enquiry should satisfy us that to our predecessors we are indebted for much of what we thought most our own, and that their errors were not wilful extravagances or the ravings of insanity, but simply hypotheses, justifiable as such at the time when they were

propounded, but which a fuller experience has proved to be inadequate. It is only by the successive testing of hypotheses and rejection of the false that truth is at last elicited. After all, what we call truth is only the hypothesis which is found to work best. Therefore in reviewing the opinions and practices of ruder ages and races we shall do well to look with leniency upon their errors as inevitable slips made in the search for truth, and to give them the benefit of that indulgence which we ourselves may one day stand in need of.

It is tempting even today to regard magic in this spirit, that is, as a collection of failed attempts at science and technology.

This is especially so as magic has the following apparent characteristics:

- (1) Its theory contains empirical generalisations.
- (2) Its hypotheses can be falsified.
- (3) Its hypotheses are used to achieve practical means to ends.
- (4) Attempts are made to theoretically explain how events in the universe came about.

These characteristics are indeed essential parts of modern science, and hence it is only natural to think of magic as trying to be a scientific activity, but doing it 'crudely'.

More is required here, however, than these superficial similarities. To see magic as a failed attempt at science and technology, and therefore as a less rational activity than the sophisticated sciences of the West, we should note that, for Popper at least, (2) and (3) are **inextricably bound up together** in rational behaviour. The very marks of rationality are, according to Popper, (1) attempts to overcome means to ends type problems, and (2) the trial and error method of solving these problems, i.e. the continual process of conjecturing and falsifying hypotheses. As Popper pointed out in his arguments

we always frame hypotheses in light of a specific problem to be overcome, and hence the problem acts as a sort of 'searchlight' to 'light up' that which is relevant to the problem. This is where science, and indeed, all rational activity begins, i.e. in the conjecturing of hypotheses in response to a problem situation. Furthermore, rationality cannot be divorced from the method of falsification, and this is the very mark of science, supposedly the most rational of all activities in virtue of its disciplined and critical approach to falsification and problem-solving. Because these activities -- problem solving and falsification -- are an integral part of the method of science, and because science is the exemplar of rationality, it follows that the rationality of any activity can be measured according to its scientific competence, that is, according to the standards of Western science.

The problem of ethnocentricity arises especially when we compare the rationality of various actions in the way Popper does with his 'zero-model' and 'world 3' ontology. The hypotheses contained in the conclusions of Western science -- both pure and applied -- supposedly approximate the world 3 objective ideal given by the zero-method closer than do the so-called 'hypotheses' contained in magic. The statements contained in world 3 which correspond closer to the objective facts in worlds 1 and 2 belong to science, not magic. That makes us, as members of the scientific Western world, more rational than those who practise magic, **fullstop!** The general laws contained in magic which Frazer has enunciated ('like produces like' and 'contact endures') are in fact very wide of the mark.

It follows from Popper's method that the primitive cultures which practise these rituals are not as rational as the people of the West. Thus, it is not until these primitive cultures become as scientifically and technologically competent as ours that they will be as rational. Fortunately, this should only be a matter of time because magic does contain at least some of the features of science (1-4 above).

Consider the following points regarding the assumption that magic is, at most, a misguided technology, especially in light of Popper's claim that all human behaviour can be explained by using the Rationality Principle, with the implication, therefore, that all human behaviour is directed towards achieving practical ends.

(1) Why is it that these primitive people do not give up these 'hypotheses' when people like Frazer enlighten them? And isn't this unusual in light of the fact that they change their stone adzes for steel axes and spears for rifles? The point being made here, of course, is that they can indeed recognize practical advantages when confronted with them.

(2) Isn't it a remarkable fact that (if Frazer and Popper are correct) for the most part of human history our ancestors -- and indeed, many of our contemporaries -- have been so utterly inept in their problem-solving techniques? And yet how can we account for them being able to make houses of wood so that they stay up, and carve arrows so that they fly properly and perform their intended task, and make canoes that glide through the water efficiently without sinking or turning circles all the time?

(3) Whilst all over the globe people have survived by mastering their environment in a number of pragmatic ways resembling each other to quite a remarkable degree, their myths

and rituals vary tremendously; in fact, anything is conceivable here. But only things that resemble arrows will fly efficiently, and only structures solidly built will not fall down, and porous canoes do not float. That is, there is on the one hand great unity shown in the methods of technology, and great diversity shown in ritual and magic on the other. In means to ends type activity people learn by mistakes, and as a result technology becomes more efficient -- this is so regardless of the primitiveness of the culture concerned, hence the unity displayed in technology. But why does this unity not apply to magic and ritual if they are attempted technologies? If they are indeed technologies, then why do those that practise them not learn from their mistakes as they do in their other technologies?

What these points hopefully begin to illustrate is that magic and ritual cannot be reduced to a technology of any sort, let alone a misguided one. These actions are not a means to ends type of activity at all for which the causal Rationality Principle is the appropriate explanatory law. Rather they serve as a **symbolic expression**, and to explain a symbolic action is to understand its meaning in the same way that we explain the meaning of a word. To understand this difference is to see human beings in an entirely different way; human beings are not just practical problem solvers -- they have concerns about life's orientation, and furthermore they express these concerns through symbolic behaviour. To see human beings through Popperian eyes is totally inadequate. More will be said on this below, but for now it is important to see the implications of this for the Rationality Principle. This takes the form of the *reductio*

outlined in the following.

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- (1) The Rationality Principle assumes that **all** rational behaviour involves the solving of problems by a trial and error method (science being the ultimate instance of this).
- (2) But magic and ritual do not consist of misguided attempts to solve problems by being a means to ends technology, instead they are symbolic expressions.
- (3) From (1) and (2) above it follows that magic and ritual cannot be explained by using the Rationality Principle.

The tradition of which Frazer and Popper are a part has assumed throughout that the only interest that mankind has is the solving of technical problems. Thus, to explain magic or ritual under this assumption is to find its historical roots in a collection of false empirical beliefs in a pseudo-scientific or technological system (note the similarity once again to Hume's genetic method of historical explanation). This tradition has an extremely limited conception of human activities and interests. People engage in all sorts of activities that are not means to ends pursuits. The one that I have chosen as an example is the symbolic or expressive activity of magic and ritual, but there are many more. If this account is correct, and I am arguing here that it is, then symbolic activities such as magic and ritual cannot be explained as activities that have the same purpose as, but fall far short of those idols of our times, science and technology. It is a category-mistake to call it a science or a pseudo-science, these terms just do not apply here. The activity of pure science is the conjecturing of explanatory hypotheses and the subsequent attempts to falsify them; and technology is the search for the antecedents required to achieve certain given ends by exploiting the general laws established by the pure sciences (remember that Popper's deductive causal model is used according

to whether our interests are theoretical, pragmatic, or historical). But the words and actions used in ritual are not hypotheses at all -- true or false -- they are expressions, and expressions can be neither confirmed nor refuted because they are neither true nor false.

The distinction I am trying to make here can be expressed in another way. In most universities there are the science and humanities faculties. The activities of the former are primarily concerned with causal explanations of the workings of the universe and the application of this knowledge for formulating means to ends, i.e. technological research. The humanities faculties consist of a cluster of disciplines primarily interested in the study of such phenomena as literature, poetry, language, religion, and history. This group has an emphasis on understanding **meaningful** human actions, and moreover these actions tend to be expressive rather than descriptive. Is a poet describing how the world 'really is'? Or is he doing something else? If it is subsequently discovered that his attempted 'description' is 'false' (that is, does not agree with the facts as they 'really are' according to science), then would that matter? No. To judge meaningful actions by the conclusions of science is logically inappropriate.

The problem still remains, however, in explaining these actions. It is extremely difficult, some say impossible, to understand the actions of foreign cultures by grasping and articulating the rules that constitute those actions. Furthermore, we have ruled out external explanations that use *de facto* descriptions as logically inappropriate. So where do we go

from here? Wittgenstein and Winch have both been dismissed as extreme relativists, but this is not so, for whilst criteria of identity are indeed relative to some given community, there are still certain themes that are common to all cultures, regardless of time or place. Winch and Wittgenstein draw attention to, among others, 'birth, sex, and death', so too do the poets and existentialists. These three factors are central to the meaningful activities of every culture and inevitably concern each one of us in some way or other. How they are coped with, on the other hand, varies tremendously -- and by the word 'coping' I do not mean the use of the medical and scientific knowledge that is available to us. For no matter what practical steps we take to avoid death, say, we know that it is inevitable for each one of us; but it is the coming to terms with this realisation that gives certain rituals their meaning: the ritual just is the expression of human beings coming to terms with this contingency, it satisfies us and allows us to go on. An anthropologist who believes that primitive rituals are aimed at achieving practical results may be compared to a person in our own Western culture who imagines that a funeral ceremony is an attempt to bring a dead person back to life. But that is absurd. The participants of a funeral are not only coping with the loss of a loved one, but are attempting to allay the fear and anxiety of the contingencies in life that the death of a loved one reminds us of: we just act in this way and feel satisfied. Whatever form the ritual may take does not really matter, so long as it possesses the significance awarded to it by its practitioners. It is a feature of human beings that we need to act in such symbolic and meaningful ways, nothing more need be said than

that. To explain such activities, then, we must relate them to the deep concerns within each one of us -- genetic explanations miss the very point at issue here. This is not to say, however, that an accurate genetic explanation could not be given for these actions, i.e. that we could not trace the origin of the practice back to some point in time, but this would not explain them in a way that would leave us satisfied because it would not expose their meaning -- the facts describing its historical development are not of importance here.

When the anthropologist is studying another culture's rituals he can explain what is going on by reference to these common concerns of all human societies. By elucidating the connections these rituals have with the rest of what goes on in a given community we can understand their significance to the people that practice them -- for it is only by such an elucidation that the criteria for their correct application is made obvious, and that just is to make clear the meaning of these activities. It is only when we study these rituals in isolation from the other everyday activities and interests of the community concerned that we think of them as being mere sorcery and humbug. The anthropologist explains the rituals by describing these conceptual underlying connections in such a way as to make them obvious, that is, he is giving reasons for these activities, not causes. As Wittgenstein has maintained, the result of successful philosophical activity is a 'perspicuous representation', in 'seeing the connections of phenomena' that have always been there in front of us. Indeed, it is their very everydayness or obviousness that makes them so elusive, we do not need to penetrate or go beyond them to understand for the very

reason that it is already there in front of us. In studying the diverse forms by which different cultures express their concern for these limiting or existential notions, we may well come to understand ourselves more as human beings; after all, such concerns are universal. It is the predominant emphasis on science and technology in Western society today that prevents us seeing the importance of the expressive nature of such rituals in not only other cultures, but also our own. We are too inclined to ask of an activity 'what practical use is it?', and reject the activity as irrational nonsense and time wasting if the answer is negative.

CHAPTER FIVE

**CONCLUSION: SUBSERVIENCE TO THE FACT**

I have been arguing that human behaviour is not a proper subject matter for science to explain, or at least not if the type of explanation used in science proper is causal. Rather, to explain human behaviour is to describe it in such a way as to make obvious its conceptual connections with its institutional and rule-governed contexts. Doing this makes the action intelligible and hence rational to us; when this is done we no longer feel the need to ask for explanations, our curiosity is satisfied. (Indeed, this gives us a hint of what irrational behaviour amounts to, i.e. behaviour that has no such conceptual relations to its context and thus it seems there are no reasons that could be properly given for it.) The important point is that giving reasons is a perfectly respectable type of explanation. In particular, its respectability is not diminished one whit just because it is not of the same causal type as that used in science.

The source of the problem lies in the word 'explanation'. We tend to think of it as having only one use, and moreover we tend to think science has the monopoly on that use. In truth, whenever we are asked for an explanation we should only answer bearing in mind the type of explanation asked for in the first place. As a mnemonic device we could (in our more technical moments at least) think of the word 'explanation' as being subscripted, the subscript depending on the type of occasion that it is being asked of -- for example, explanation<sub>(S)</sub> and explanation<sub>(N)</sub> being used in explaining social and natural events respectively.

To end this dissertation, it must be asked why both physical and social scientists have continually ignored the special status

of (1) symbolic human action *vis-a-vis* natural events, and (2) explanation(<sub>S</sub>) by reasons and rules *vis-a-vis* explanation(<sub>N</sub>) by natural laws.

The answer, I think, lies in a theme that is perennial in the history of Western thought. Plato was concerned primarily with what the world had to be like in order for us to really know it; and rejected art, for instance, because it merely catered for the sensuous pleasures of 'the lovers of sights and sounds' rather than attempting to gain access to True Reality. Descartes tried to set up a system of knowledge based on indubitable axioms -- a foundation of *a priori* knowledge that could not possibly be mistaken. The empiricists too based their whole philosophy around a system of knowledge deriving from the incorrigibility of private sensations. Even Popper portrays his philosophy of science as an epistemology, an 'evolutionary epistemology' of trial and error conjectures for getting closer and closer approximations to the truth. No matter whether we call the above philosophers 'empiricists', 'rationalists', 'naturalists', 'idealists', or 'realists', their emphasis is first and foremost **epistemological**. Their motivation is provided by their desire to get to the basic facts -- whatever the metaphysical status of these facts may turn out to be.

From Descartes' time especially, science and technology have progressed enormously, and so impressed are we by the achievements of the scientists and technologists that we consider them to be the sole prophets of wisdom and truth. Scientists are now the arbiters of epistemology. We resort to facts that have been scientifically established to decide the case whatever its nature might be; to decide on the basis of inspiration, poetry,

or art, is deemed to be a sign of irrationality. Modern society in the West is then characterised by an almost complete submission to 'The Fact'. Philosophy has not escaped this; throughout its history it has been concerned predominantly with epistemology -- the study of subjects like ethics or aesthetics has always taken second place. As a result we now consider that the work of the fact-finders (the scientists) possesses more value and importance than the work of poets, artists, and novelists. We now think that the only problems worth pursuing are factual problems, the others after all, have no real objective factual content.

With the rise in respect for 'The Fact', there has been a corresponding decline in respect for the symbolism expressed in the arts (excepting, of course, when it attempts to picture the facts as they 'really are' -- Plato again). We reject the reality of symbols because the facts established by science have supposedly proved them wrong. The function of language is seen to be primarily fact-stating, so much so that Wittgenstein's famous one-liner 'What we cannot speak about we must pass over in silence' has been taken to mean that if we cannot in principle state the relevant facts about something, then there is no reality to state. There is, however, a much deeper meaning to this quote than meets the undiscerning eye, i.e. the questions that possess the most philosophical importance are just those that cannot be stated or asked about as if they are facts or matters of epistemology. As a result of this unhealthy predominance of 'The Fact', we look at nature, say, solely in order to exploit it -- it can, after all, be used as a practical means to some end. We do not look for peace or tranquility in

our forests anymore, instead we cut them down. We do not see an awful power in a raging river, we see an untapped energy resource. We do not see beauty in a flower, but a marketable commodity. Death and birth have become clinical and sterile -- not powerfully symbolic as even the most ancient religions have perceived them (indeed, our attempts to pretend that death never occurs, that is, brushing off its significance, can go to quite sickening lengths).

Against all this I wish to urge that to deny the symbolic aspect of ourselves is to deny our status as human beings. The very thing that separates us from other forms of life is not that we are merely more complex, but that we use symbols to express what has importance or value for us. This happens, or should be allowed to happen, as much in Western society as it does in the less inhibited primitive cultures. And it would happen more if it were not suppressed due to the attached stigma of its supposed irrationality, 'rationality' just meaning 'based on the facts'. Consider religion. We often tend to think of our own religious beliefs as the rational ones. But our religion is no more or less rational than the magic and ritual of the Azande -- both activities function to alleviate anxiety and fear in the face of contingencies, and also to give a moral orientation in life. When we take religion out of its proper context and make it into some kind of metaphysical system, as we too often do with our own, the whole activity loses its point because it no longer bears the connections to the activities which once made it meaningful. It is really this that amounts to irrational or pseudo-religion. This is not to say that genuine ritual in our Western religions has the same meaning as ritual in primitive

religions, for the meaning of these rituals depends on the connections they have with whatever else is important to that particular culture. Obviously a culture more at the mercy of the whims of nature than another will have a symbolic emphasis on the weather, animals, and plants; whereas those very same objects may take on a different meaning entirely in some other culture. Furthermore, symbolic behaviour is not limited to religious activity, we manifest it every day of our lives in all manner of ways, indeed we cannot escape it and still call ourselves human.<sup>1</sup>

When I am furious about something, I sometimes beat the ground or a tree with my walking stick. But I certainly do not believe that the ground is to blame or that my beating can help anything. "I am venting my anger". And all rites are of this kind. Such actions may be called Instinct-actions -- And an historical explanation, say, that I or my ancestors previously believed that beating the ground does help is shadow-boxing, for it is a superfluous assumption and explains *nothing*. The similarity of the action to an act of punishment is important, but nothing more than this similarity can be asserted.

Human beings live in a world constituted by meanings, not a world consisting of brute facts.

Philosophers like Wittgenstein, Winch, and Searle show us that science is only **one** of the interests that human beings pursue. Popper plays an important part in the above pages only as an example of a certain tradition, the tradition that emphasizes the importance of acting in accordance with 'The Facts' over all else in rational behaviour. But he is only one variation of the same theme -- Hume, Mill, and Hempel were playing other variations of the same 'respect for the ultimacy of the facts' theme. I think we deny our symbolic nature at our own peril -- for it is just this that gives unity, orientation, and meaning to otherwise insignificant unrelated activities. Denying

this aspect of ourselves because of some alleged ultimacy of 'The Fact' inevitably leads to alienation and apathy. Some of the more contemporary Continental philosophers have been perceptive enough to see this, but with only few exceptions, the American and English philosophers are still arguing over the status of facts and our ability to come to know them -- they don't even seem to understand what the other philosophers are getting at and shrug it off as mere 'irrationalism' or an 'interesting' period in the history of Western philosophy.

I want to finish here with a quote from a chapter of Dickens' Hard Times appropriately entitled 'Murdering the Innocents'. Dickens is not concerned for the welfare of innocent children only, the chapter title applies to all us innocents too.<sup>2</sup>

Now, what I want is, Facts. Teach these boys and girls nothing but Facts. Facts alone are wanted in life. Plant nothing else, and root out everything else. You can only form the minds of reasoning animals upon Facts: nothing else will ever be of any service to them.... [T]hey swept with their eyes the inclined plane of little vessels then and there arranged in order, ready to have imperial gallons of facts poured into them until they were full to the brim.

Our symbolic lives, and therefore the orientation that our lives take, have become impoverished indeed in these so-called 'civilised' times of high technology and science.

FOOTNOTESCHAPTER ONE: THE POSITIVIST TRADITION

- (1) D. Hume, Inquiry, p.26ff.
- (2) *ibid.*, p.74f, see also p.84f.
- (3) *ibid.*, p.87.
- (4) *ibid.*, p.168.
- (5) D. Hume, Treatise, p.173ff.
- (6) D. Hume, Enquiry, p.50.
- (7) D. Hume, Treatise, p.317f,401,575f.
- (8) *ibid.*, p.176f, see also Inquiry, section IX.
- (9) D. Hume, Inquiry, p.34, see also p.93.
- (10) *ibid.*, p.92ff.
- (11) D. Hume, Natural History, p.39f.
- (12) J.S. Mill, Logic, p.390.
- (13) *ibid.*, p.389.
- (14) *ibid.*, p.391.
- (15) *ibid.*, p.461f,492.
- (16) J.S. Mill, Examination, p.191.
- (17) J.S. Mill, Logic, p.879.
- (18) *ibid.*, p.869.
- (19) *ibid.*, p.891.
- (20) *ibid.*, p.901f.
- (21) *ibid.*, p.869f.
- (22) *ibid.*, p.873f.
- (23) K.G. Hempel, Aspects, p.247f.
- (24) *ibid.*, p.22.
- (25) K.G. Hempel, 'Logical Analysis of Psychology', p.379.
- (26) K.G. Hempel, Aspects, p.251ff.
- (27) K.G. Hempel, 'Explanation in Science and History', p.106f.

(28) R. Carnap, 'Testability and Meaning', p.52.

(29) K.G. Hempel, Aspects, p.461.

(30) *ibid.*, p.462.

(31) *ibid.*, p.460f.

#### CHAPTER TWO: POPPER'S 'NEW' METHOD

(1) K. Popper, Open Society, vol.ii, p.260.

(2) K. Popper, Poverty, p.122ff.

(3) K. Popper, Open Society, vol.ii, p.363f.

(4) *ibid.*, p.264f, see also Poverty, p.145f.

(5) K. Popper, Open Society, vol.i, p.32, see also Poverty,  
p.28f.

(6) K. Popper, Poverty, p.135f.

(7) *ibid.*, p.141.

(8) K. Popper, Open Society, vol.ii, p.265.

(9) K. Popper, Objective Knowledge, p.191ff,349.

(10) K. Popper, 'The Rationality Principle', p.361.

(11) This diagram is a modified version of Eccles, Facing  
Reality, p.165.

(12) K. Popper, Conjectures and Refutations, p.105.

(13) K. Popper, 'Autobiography', p.146f.

(14) Plato, Sophist, 247e.

(15) K. Popper, 'The Rationality Principle', p.363, see also  
Objective Knowledge, p.179.

(16) K. Popper, Objective Knowledge, p.328f.

(17) K. Popper, 'Logic of the Social Sciences', p.100.

(18) *ibid.*, p.145f.

(19) K. Popper, 'Autobiography', p.107, see also Objective  
Knowledge, p.242.

(20) K. Popper, Objective Knowledge, p.119.

(21) *ibid.*, p.70.

(22) *ibid.*, p.120.

#### CHAPTER THREE: RULES AND UNDERSTANDING

(1) L. Wittgenstein, Blue and Brown Books, p.24f.

(2) L. Wittgenstein, Investigations, Part 1, §376.

(3) *ibid.*, Part 1, §79.

(4) *ibid.*, Part 1, §79.

(5) L. Wittgenstein, Blue and Brown Books, p.90.

(6) L. Wittgenstein, Investigations, Part 1, §202.

(7) L. Wittgenstein, Remarks on the Foundations of Mathematics,  
p.47.

(8) *ibid.*, p.162.

(9) L. Wittgenstein, Investigations, Part 1, §198, see also §201.

(10) L. Wittgenstein, On Certainty, §94, §140-1, §298.

(11) L. Wittgenstein, Investigations, Part 1, §206, §219.

(12) P. Winch, Idea of a Social Science, p.30.

(13) *ibid.*, p.83f.

(14) *ibid.*, p.84.

(15) *ibid.*, p.89.

(16) *ibid.*, p.45f.

(17) *ibid.*, p.115.

(18) J. Searle, Speech Acts, p.51f.

#### CHAPTER FOUR: THE RATIONALITY PRINCIPLE REVISITED

(1) F. Hanson, Meaning in Culture, p.91.

(2) K. Popper, Objective Knowledge, p.183.

(3) J. Frazer, The Golden Bough, p.12f.

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(4) ibid., p.307.

**CHAPTER FIVE: CONCLUSION: SUBSERVIENCE TO THE FACT**

- (1) L. Wittgenstein, 'Remarks on Frazer's Golden Bough', p.72.
- (2) C. Dickens, Hard Times, P.47f.

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