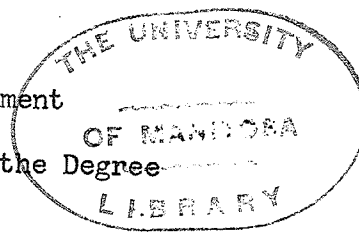


CONTEMPORARY THEORIES OF EXPLANATION
IN SCIENCE AND HISTORY

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ABSTRACT

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The purpose of this thesis is to examine and evaluate Hempel's model for scientific explanations and to consider whether the model can be extended to include explanations in the social sciences and especially in history. It is Hempel's view that (1) scientific and historical explanations consist of statements of initial conditions and of explicit or implicit laws, and (2) that the event to be explained is logically deducible from the conjunction of the statements of initial conditions and the laws. In those cases where the required laws are not yet established we will have to be satisfied with subsuming the event to be explained under a statistical generalization. Any explanation which fails to conform to this Hempelian model is either an incomplete or a pseudo-explanation.

The arguments advanced by Dray are designed to show that the Hempelian model is not suitable for historical explanations. Dray argues that the insistence on having a law of some kind as part of an explanation leads to the inclusion of laws that are trivially true or are of such a high level of generality that it is difficult to conceive of anything which would be excluded by the law. Further, if we accept statistical generalizations another difficulty arises. Whatever statistical generalization is appealed to in explaining a particular event, the same

statistical generalization can be appealed to in explaining the non-occurrence of that event. In an attempt to avoid these difficulties, Dray suggests that an historical event can be explained by an exercise of the historian's judgment. Unfortunately this proposal is also unacceptable, as I try to show, and for several reasons.

Finally, during the course of my examination of the above views, I have tried to show that Hempel and Dray do not disagree as much as it might at first appear. It is my contention that they are concerned with distinct, but nevertheless related, aspects of what it is for one person to explain something to another by means of a group of statements.

TABLE OF CONTENTS

CHAPTER	PAGE
I. SCIENTIFIC EXPLANATIONS	1
Introduction	1
The Meaning of "Explanation"	4
A Statement of the Hempelian Model	9
Explanation and Prediction	17
Scheffler's Criticism of the Structural	
Identity of Explanation and Prediction	19
The Scope of the Hempelian Model	25
II. HISTORICAL EXPLANATIONS	30
Introduction	30
Extension of the Model	31
Some Misunderstandings About the Model	34
Dray's Criticism of the Model	37
The Argument from Meaning	47
The Argument from Generalization	49
The Argument from Uniqueness	50
Dray's Tough-minded Thesis	53
Dray's Tender-minded Thesis	58
III. A REFORMULATION OF THE PROBLEM	65
Introduction	65
The General Problem	68
Diagram	74

BIBLIOGRAPHY	83
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CHAPTER I

SCIENTIFIC EXPLANATION

1. Introduction

In recent years philosophers have spent considerable time and energy discussing the problem of what it is to explain something. In spite of the effort expended, however, the precise nature of the problem is by no means yet clear. Perhaps the reason for the uncertainty about the problem is that, contrary to what one might at first suppose, there is no single problem of explanation. Instead, an analysis of the logical structure of explanations indicates a group of closely inter-related problems. Among the questions that are not always as sharply separated as they should be are the following: What is the meaning of the word "explain"? What are the criteria that must be satisfied before we call something an explanation? Do all explanations have the formal structure of a deductive argument? Do historical explanations have the same logical structure as scientific explanations; if they do, must they; if they do not, what is the difference? If there is a difference, does this difference hinge upon the "uniqueness" of historical events; upon the possibility of "objectivity" in history? Do all explanations make an explicit or implicit appeal to some law or generalization? Are such laws general laws or statistical laws? One could continue at length to list further problems that are connected with the general

problem of the logical structure of explanations. However, the examples given sufficiently indicate the complexity of what at first appears to be a relatively simple question, namely, What is it to explain something?

When we are asked to explain something, the request may be for an answer to any one of a number of different questions. Sometimes we are merely being asked to clarify something that has been said, to restate the assertion in simpler terms. At other times the request is for an explanation of the meaning of a word; or for a detailed account of what happened; or an account of how someone arrived at a particular decision. These and similar questions are continually being asked or answered by us during the course of our everyday lives. In this essay, I shall be concerned only with those explanations that are given in answer to the question "Why?".

The question "Why?" is usually asked when a person is confronted with a phenomenon which surprises him, i.e., when what happens is unexpected. There are many familiar experiences which produce this kind of bewilderment. One common example is the puzzlement that arises when someone first observes that a stick, which he knows is straight, appears to be bent when it is partially submerged in water. The observer's senses have apparently deceived him; prior to being partially submerged in the water, the stick was felt and seen to be straight; now, it still feels straight but it looks crooked. Is the stick really crooked? Here the question naturally arises, Why does the stick look as if it is crooked? This puzzling experience can be

explained in terms of Snell's law of refraction. In fact, once we know Snell's law, we are not at all surprised that the stick appears to be bent when partially submerged. On the contrary, we fully expect it to appear crooked and would be surprised if it did not.

As this example shows, we have been presented, in answer to the question "Why?", with a series of related statements. Once we agree that these statements remove the puzzlement which occasioned our original question, then we can say that the answer given is an explanation. Someone might bring to our attention the fact that the explanation given is identical with the explainer's reason for believing that the stick is not crooked; his reason for believing this is Snell's law and this, as we have seen, is also the explanation of the appearance of the straight stick as crooked. Such a person might then conclude that there is no difference between giving reasons and giving an explanation. This view rests upon a confusion. We must be careful to distinguish between giving a reason for a belief, in other words, giving evidence for a belief, and explaining why a person holds that belief. It is true that in our particular example the two coincide but this is not always necessarily so. Consider, for example, a person who holds a belief known to be false. He may "give reasons" for his belief, but since we cannot accept his "reasons" as genuine, we would go on to ask for an explanation, in causal terms, for his holding the belief. Obviously the answers given to the question "Why?" will depend upon what is being asked for. It is important, therefore, to realize that there is a difference between explaining and giving

reasons.

2. The Meaning of "Explanation"

It might well be argued that whether this distinction is sound depends upon what is meant by the word "explanation". In support of our distinction and also as a preliminary to the problems we shall be discussing later, it is important to recognize that the word "explanation" is often used in two different senses. The importance of being aware of this is that what we want to say and what we can say about explanation will be dependent upon the sense in which we use the word "explanation". If we wish to talk about the correct linguistic use of the word "explanation" then we are using "explanation" in its non-normative sense. On the other hand if we want to say of an explanation which is not satisfactory that it is "no explanation" then we are using the word "explanation" in its normative sense. Let me amplify this distinction. Consider the following two statements:

- (1) X is a work of art.
- (2) X is a good work of art.

If both of these statements are admitted then the phrase "a work of art" is being used in a non-normative sense. In order to be linguistically correct in our use of this phrase in this sense, we have to use it in accordance with certain criteria. The criteria for the non-normative use of the phrase "a work of art" are, to mention only a few, that X was made by some person, that this person had a certain purpose in mind when he created X, that X was created by the exertion of effort and

exercise of skill, that X was made in a certain manner, and so on. We need not concern ourselves with a precise analysis of all the criteria that must be met if we are to use the phrase "a work of art" in a non-normative sense. The important point to be noted is that if these criteria are satisfied we are justified in calling X "a work of art". In the case of the second statement above, however, we are concerned with more than mere linguistic correctness. Whereas the first statement is an empirical statement or a factual judgment, the second statement is an evaluative statement or a normative judgment. If we are to speak of X as a good work of art certain criteria, additional to those mentioned above, must be satisfied if our judgment is to be justified. Again, what these additional criteria are need not concern us at present; the establishment of these criteria is a problem in the field of aesthetics. What should be noted here is that the criteria for the correct linguistic use of "a work of art" are not identical with the criteria that must be satisfied if we are to make an aesthetic appraisal of X.

The sense in which we use certain terms not only restricts the kind of assertions that we can make but it also limits the kind of questions that can be legitimately asked. For example, the word "cat" is used to refer to a cat and we are aware of the error involved when we speak of an animal that has four legs, a tail, barks and in general has the characteristic "dogginess" as a cat. In other words, we have certain criteria for the linguistically correct use of a term like "cat". In those cases in which these criteria are satisfied, the question

"But is this really a cat?" cannot arise; such a question makes no sense. With regard to normative terms on the other hand, even if the criteria of linguistic correctness are satisfied, the question "But is it really a case of --?" may still arise. For example, linguistic rules specify that the word "wrong" must be used, in a moral sense, to refer to an action. But when this is done we can still ask "Is the act really wrong?"

In this essay I shall be using the word "explanation" in its non-normative or descriptive sense. Thus, to say that a certain group of statements is an explanation is to describe that group of statements, but to say that those statements constitute a satisfactory explanation is to appraise them. In the latter case we are making a normative judgment. The question that naturally arises is, When are we justified in calling an explanation a "satisfactory" explanation? The immediate answer is: A satisfactory explanation is one that fulfills certain criteria. Such an answer is obviously inadequate; we want to know what these criteria are. In general terms, a more adequate answer is that the statements in the explanation must satisfy certain logical and epistemic requirements, and at the same time, the person giving the explanation must be in a certain state of belief, i.e., certain psychological conditions must be met. Thus, we would be justified in saying "So and so is a satisfactory explanation" if and only if certain normative and non-normative criteria are fulfilled.

Another problem concerning the meaning of the word "explanation" is suggested by the following quotations:

- 1) What is an explanation for one person may be none at all for another, since its achievement in this direction will vary in accordance with the factual beliefs (or even the emotional make up and current feelings) of those interested.¹
- 2) I believe that examination will show that the essence of an explanation consists in reducing a situation to elements with which we are so familiar that we accept them as a matter of course, so that our curiosity rests.²
- 3) An explanation ... gives some degree of intellectual satisfaction to the questioner.³
- 4) What is familiar is usually taken to be understood so that in its simplest form the answer to the question consists in pointing out a connection between the fact to be explained and something that is familiar.⁴

Critics of the view expressed in the above quotations agree that often what is unfamiliar is explained in terms of something that is familiar. For example, well-known mechanical models have commonly been used to construct explanations for such various phenomena as heat, light, electricity, and even human behaviour. But this, it is argued, is no reason to reject as inadequate or unsatisfactory any explanation that is couched in unfamiliar terms. The bleaching effect of sunlight on colored materials is explained in terms of physical and chemical assumptions about the composition of light and of colored substances --

¹ J. Cohen, "Teleological Explanation," Proceedings of the Aristotelian Society (London: Harrison & Sons, Ltd., 1951), p. 259.

² P. W. Bridgman, The Logic of Modern Physics (New York: The Macmillan Company, 1927), p. 37.

³ R. B. Braithwaite, Scientific Explanation (London: Cambridge University Press, 1959), p. 323.

⁴ L. S. Stebbing, A Modern Introduction to Logic (second edition; London: Methuen & Co. Ltd., 1933), p. 389.

such an explanation uses unfamiliar terms and concepts to explain what is familiar. There is nothing unusual about this. As Nagel points out,

throughout the history of science explanatory hypotheses have been frequently introduced which postulate modes of inter-relation between assumed elements, where the interrelations and elements are initially strange and occasionally even seemingly paradoxical.⁵

Or, as Hospers expresses it,

familiarity is irrelevant to its validity as an explanation. Familiarity is, in any case, a subjective matter -- what is familiar to you may not be familiar to me; and yet the explanation, if true, is as true for me as for you.⁶

Both Hospers and Nagel point out that the truth inherent in the remarks of Stebbing and Bridgman is that the premises on which a satisfactory explanation is grounded must be familiar in the sense that one of the premises is either a law or a generalization.

Cohen, Stebbing, and Bridgman insist, however, that they would not reject an explanation as being unsatisfactory simply because of the unfamiliarity of the concepts involved. Their point is, while the statements proffered as an explanation may be true, a person who did not understand the terminology being used would not feel that he had been given an explanation. The point at issue here involves the question of whether or not an explanation must be helpful to the person

⁵ E. Nagel, The Structure of Science (New York: Harcourt, Brace & World, Inc., 1961), p. 46.

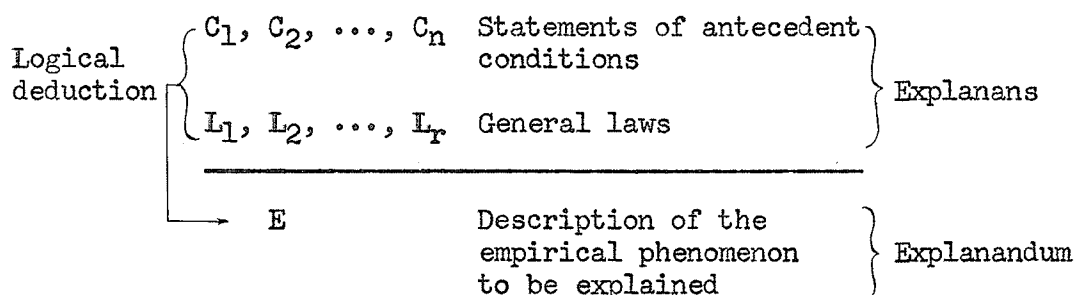
⁶ J. Hospers, "What is Explanation?" Essays in Conceptual Analysis, A. G. N. Flew, editor (London: Macmillan & Co. Ltd., 1956), p. 98.

to whom it is given, i.e., the "explainee". This is distinct from the question of whether or not a proffered explanation is satisfactory. It is only this latter problem with which this essay is concerned.

3. A Statement of the Hempelian Model

The problems with which I am concerned stem primarily from two key articles by C. G. Hempel, the first published in 1942 and titled The Function of General Laws in History, the second published in 1948 in collaboration with P. Oppenheim and entitled The Logic of Explanation. Since Hempel was the first contemporary philosopher to give a comprehensive exposition of the logical structure of scientific explanation, I shall refer honoris causa to the model he presents as the "Hempelian" model. As I proceed with the analysis of the argument presented by Hempel, I shall also endeavor to illustrate how some of the problems already mentioned above first arose.

In both his articles Hempel's professed aim was to investigate and state explicitly the essential logical conditions of a scientific explanation. He summarized and presented the basic characteristics or pattern of a scientific explanation in the following schema:



This Hempelian model⁷ is merely a diagrammatic way of saying that an explanation consists of the following groups of statements:⁸

- (1) An "explanandum" = df. "the sentence describing the phenomenon to be explained (not that phenomenon itself)."
- (2) An "explanans" = df. "the class of those sentences which are adduced to account for the phenomenon."
 - (a) $C_1, C_2, \dots, C_n$ are sentences "which state specific antecedent conditions", i.e., they refer to particular facts or kinds of events.
 - (b) $L_1, L_2, \dots, L_r$ are a set of sentences representing general laws.

In addition to indicating that an explanation consists of certain groups of statements, the above schematic diagram also reveals the logical conditions that such groups of statements must satisfy if they are to constitute a satisfactory explanation. Reverting to a more technical terminology, Hempel states that the necessary conditions for a satisfactory explanation, where T and C are an ordered pair of sentences (i.e., the explanans), and E is a singular sentence (i.e., the explanandum), are as follows:⁹

- (1) T, C, and E are each meaningful, and each is factually true.

⁷ C. G. Hempel and P. Oppenheim, "The Logic of Explanation," Readings in the Philosophy of Science, H. Feigl and M. Brodbeck, editors (New York: Appleton - Century - Crofts, Inc., 1953), p. 322.

⁸ Ibid., p. 321.

⁹ Ibid., p. 350.

- (2) E is logically implied by a conjunction of T and C but not by C alone.
- (3) E is a molecule¹⁰ or a law.
- (4) C, when C is a sentence, is a molecule.
- (5) T is a conjunction of n conjunctions ($n \geq 1$) each of which is essentially generalized, at least one of which is a law while the others are exactly like a law except that they need not be purely universal.

In summary, what Hempel is maintaining is that to explain an act or an event is to subsume what is to be explained under a general law. Stated in these simple terms the first question usually asked is, What is a law? The search for an adequate answer to this question constitutes one of the major problems amid a multitude of problems connected with a general analysis of explanation. However, most of the solutions that have been put forward in answer to this question are on a highly technical level and so, despite the importance of this problem, I shall confine myself to a few brief and general remarks.

Hempel is fully aware of the importance of being able to provide a satisfactory answer to the question, What is a law?, or as the problem is sometimes formulated, to find an adequate definition of lawlike statements. Lawlike statements play a crucial role in his theory of scientific explanation, for it is in terms of subsumption under a law

¹⁰ A sentence is said to be molecular or singular if it contains no variables. If such a sentence is free of statement connectives it is also called an atomic sentence.

that an event is to be explained. Consequently, Hempel proposes three definitions in an attempt to explicate the meaning of lawlike statements:¹¹

- (1) "L is a law" = df. "L is a fundamental or derivative law.
- (2) "L is a fundamental law" = df. "L is true and either purely or essentially universal; the scope of the quantifier is unrestricted by the meanings of the terms in L; and all non-logical terms in L are purely qualitative, i.e., the meaning of any term in L can be explained without appealing to any particular thing or particular group of things."
- (3) "L is a derivative law" = df. "L is a logical consequence of some set of fundamental lawlike statements."

The difficulty with these definitions, as Nagel points out in his most recent book,¹² is twofold. First, if we consider the Keplerian laws before Newton's time, we find that we have universal conditionals that are neither constructed of purely qualitative predicates nor logically deducible from a set of fundamental laws. Secondly, there is no available method of deriving Kepler's laws from Newton's theory of mechanics and gravitation without using additional premises which contain non-qualitative predicates. If this is the case, Hempel's proposed definitions would eliminate an indefinite number of lawlike statements which are recognized as laws. It would seem then, that Hempel's

¹¹ Ibid., p. 344.

¹² Nagel, op. cit., p. 58.

explication of lawlike statements is much too restrictive. One should not infer from Nagel's criticism that Hempel thought that he had successfully explicated the meaning of lawlike statements, for as we continue, we shall see that Hempel himself was well aware of the fact that certain difficulties remained to be overcome.

According to Hempel, then, an explanation consists of subsuming the event to be explained under a general law. A question that still remains to be answered is, What kind of explanations does the Hempelian theory refer to? In their joint article, Hempel and Oppenheim state explicitly that their investigation is restricted to causal explanations.

If E describes a particular event, then the antecedent circumstances described in the sentences $C_1, C_2, \dots, C_n$ may be said jointly to "cause" that event, in the sense that there are certain empirical regularities expressed by the laws $L_1, L_2, \dots, L_r$, which imply that whenever conditions of the kind indicated by $C_1, C_2, \dots, C_n$ occur, an event of the kind described in E will take place.¹³

A common example will illustrate the above quotation. A person might well be perplexed if, while watching a piece of ice which is partially submerged in a container full of water, the ice begins to melt but the water retains its original level. What is the explanation for this unexpected result? In the terminology of the Hempelian model, the explanandum is the singular statement that after the ice had melted, only water remained in the container and its level remained unchanged. The explanans states certain universal laws of physics; one of these laws is that a fluid buoys up a body immersed in it with a force equal

¹³Hempel & Oppenheim, op. cit., p. 324.

to the weight of the fluid displaced by that body. Another law in the explanans is that at any fixed temperature and pressure, amounts of water that are equal in weight are also equal in volume. In addition to such laws the explanans also contains statements of the antecedent conditions, for example, the piece of ice is floating in a container full of water, the water is at room temperature, etc. The important thing to notice in this illustration is the deductive relationship between the statements comprising the explanation; the conclusion, E, follows necessarily from a conjunction of the premises, or to put the same point in still another way, it is a logical contradiction to affirm the premises and at the same time deny the conclusion. This deductive relationship is to be distinguished from the relationship between the things to which the statements refer; the latter relation is one of causality.

For the sake of classification, Hempel refers to the type of explanation discussed above as a "deductive nomological explanation".¹⁴ With respect to this type of explanation, Hempel has sometimes been erroneously interpreted as maintaining that all deductive nomological explanations are causal explanations. Such a misinterpretation is understandable, for Hempel's early writings on this topic are rather vague. It is only recently that he has removed the confusion inherent

¹⁴ C. G. Hempel, "The Logic of Functional Analysis," Symposium On Sociological Theory, L. Gross, editor (New York: Row, Peterson and Company, 1959), p. 273.

in the earlier presentations of his theory. In the latest expansion of his theory in an article entitled "The Logic of Functional Analysis,"¹⁵ he states categorically that not every deductive nomological explanation is a causal explanation. It cannot be held, he says, "that the regularities expressed by Newton's laws of motion and of gravitation cause the free fall of bodies near the earth's surface to satisfy Galileo's laws."¹⁶

In this same article, an important modification is made in the Hempelian model in order to acknowledge another type of explanation, called "an explanation by inductive subsumption under statistical laws, or briefly, an inductive explanation."¹⁷ Inductive explanations are still of the general form of a nomological explanation; the event to be explained is still subsumed under a law, but now the law is a statistical law and the inference, instead of being necessary as in his previous presentation, is only highly probable. A universal law states that all cases satisfying certain antecedent conditions A, are followed by the occurrence of an event of kind B; in contrast, a statistical law states the probability of A's being accompanied by an event of kind B. It follows, therefore, that the premises of an inductive explanation do not logically imply the conclusion; rather they make the conclusion more or less probable according to the degree to which the statistical law has

¹⁵ Ibid., pp. 271 - 310.

¹⁷ Ibid., p. 276.

¹⁶ Ibid., p. 275.

been confirmed. Consequently, the second necessary condition for a correct explanation as listed on page eleven (11) will be altered to read, that E is confirmed to some degree by a conjunction of T and C, but not by C alone. At this stage it will be necessary to close our present discussion, for any further consideration of the logic of inductive inference would involve a number of problems beyond the scope of this essay. Hence, while some persons, for example Gluck¹⁸ and Braithwaite,¹⁹ have fastened on many of the intriguing problems in this area, we shall confine ourselves to an analysis of some of the difficulties surrounding deductive nomological explanations.

So far, we have discussed two important features of Hempel's theory of scientific explanation; first, not every deductive nomological explanation is a causal explanation; secondly, not every explanation follows the deductive pattern. In addition to these differences just mentioned, scientific explanations differ in still another way. Some scientific explanations, as our example of the stick illustrated, are concerned with explaining particular or individual happenings; for example, an earthquake, a political murder, or a victory in battle. However, some scientific explanations are concerned with explaining a general law in terms of another more comprehensive law. It is with respect to this latter kind of explanation that we are again reminded

¹⁸ S. E. Gluck, "Do Statistical Laws Have Explanatory Efficacy?" Philosophy of Science, 22 (1955), pp. 34 - 38.

¹⁹ Braithwaite, op. cit., Chaps. V - VII.

of the importance of being able to adequately define lawlike statements. In this connection Hempel points out another difficulty that arises when the epistemic condition, (viz. that every statement in the explanation be true) is not restricted in a certain way. The required restriction is that the truth of the explanans be established independently of the truth of the explanandum; we must be able to know the truth of the premises without first having to know the truth of the conclusion. If this restriction is not made, we would have to accept certain pointless or circular "explanations" as being genuine explanations. The example Hempel gives is that

Kepler's laws, K, may be conjoined with Boyle's law, B, to a stronger law K.B; but derivation of K from the latter ... would be viewed as ... a pointless "explanation" of Kepler's laws by themselves. The derivation of Kepler's laws from Newton's laws of motion and of gravitation, on the other hand, would be recognized as a genuine explanation in terms of more comprehensive regularities, or so called higher level laws. ... The establishment of adequate criteria for this purpose (i.e., the distinguishing of levels of explanation) is as yet an open problem.²⁰

4. Explanation and Prediction

Closely allied with explanation is prediction. During the course of Hempel's exposition of his theory of the logic of scientific explanation, the claim is made that prediction and explanation are structurally identical; the only difference between the two is of a pragmatic character. Hempel's argument in support of this thesis is

²⁰ Hempel and Oppenheim, op. cit., n.p. 345.

as follows:

If E ... has occurred, and a suitable set of statements $C_1, C_2, \dots, C_k, L_1, L_2, \dots, L_r$ is provided afterwards, we speak of an explanation of the phenomenon in question. If the latter statements are given and E is derived prior to the occurrence of the phenomenon it describes, we speak of prediction. It may be said, therefore, that an explanation is not fully adequate unless its explanans if taken account of in time, could have served as a basis for predicting the phenomenon under consideration.²¹

In simpler terms, the thesis advanced by Hempel is that to predict E is merely to explain E before E has occurred.

The function of a prediction is to provide a test for determining whether as a matter of fact, what is presented as an explanation, is a satisfactory explanation. Prediction is the only means we have of distinguishing between pseudo and genuine explanations. In a satisfactory explanation the explanans must assert something more than what is asserted in the explanandum; an explanation that can only explain the phenomenon for which it was invoked, is a pseudo-explanation. Perhaps the most common illustration of a pseudo-explanation is the "explanation" that opium induces sleep because it has a soporific power. To say a drug has soporific power is to say nothing more than it has the power to put people to sleep. Hence, the "explanation" tells us that a sleep-producing drug has the power to put people to sleep. The fact to be explained has merely been rephrased; we still are not told why this particular drug, opium, produces sleep and why other drugs do not. In

²¹ Ibid., p. 322 - 323.

contrast, in a satisfactory explanation the explanatory hypothesis explains more than just one phenomenon. For example, various aspects of planetary motion, the motion of a pendulum, and the movement of tides, to mention only a few phenomena, can all be explained in terms of Newton's laws of motion and gravitation. Another important point about prediction is that it is also a means whereby we can choose between alternative explanatory hypotheses. We accept the hypothesis whose explanatory range exceeds that of any competing hypothesis, with the qualification that the former hypothesis be at least falsifiable in principle; any hypothesis which purports to explain everything, explains nothing and hence must be rejected.

5. Scheffler's Criticism of the Structural Identity of Explanation and Prediction

In opposition to Hempel, Scheffler has argued that explanation and prediction are structurally distinct.²² The reasons Scheffler gives in support of his thesis are as follows: First, if after the occurrence of a predicted event we were to restate the prediction, even if the prediction were true, we would still not have explained that particular event. The statement "John F. Kennedy will be elected President in November 1960", though a true statement at any time prior to November 1960, does not explain Senator Kennedy's election. Nor is it sufficient

²² I. Scheffler, "Explanation, Prediction and Abstraction," The British Journal for the Philosophy of Science, 7 (1959), pp. 293 - 309.

to rebut this criticism by asking how such a prediction could be made without reference to some general laws or antecedent conditions. Even if the origin of the prediction is based on irrational behaviour, neither "its predictiveness in the ordinary sense"²³ nor its truth are affected -- witness, for example, the predictions made by clairvoyants, prophets, and news commentators. Secondly, if it is granted that explanation and "rational" prediction involve reference to general laws and specific conditions, we still have a situation wherein we can have false predictions. But in an explanation the explanans must be true, hence, the explanandum which is a logical consequence of the explanans must also be true. In other words an explanation, unlike a prediction, cannot be false. Indeed, it is to the extent that a prediction constitutes a test for the confirmation of general laws, that "the possibility of falsifying predictions is presupposed by the confirmation of explanations".²⁴ Thirdly, if the claim of structural identity is said to hold only between rational prediction and proffered explanation, the claim would still be untenable. A proffered explanation may indeed be false if it violates any one of the necessary conditions of a satisfactory explanation, nevertheless its explanandum must be true for otherwise we would not have originally considered the account to be a proffered explanation. However, in a prediction the explanandum may be false. If, to surmount

²³ Ibid., p. 296.

²⁴ Ibid., p. 297.

this difficulty, the logical requirements for an explanation are altered so that it is no longer a requirement for the explanans and explanandum to be true, then the claim of structural identity between explanation and prediction becomes trivial. Scheffler's conclusion, therefore, is that explanation and prediction have different logical characteristics:

explanations are true, predictions need not be; making predictions is part of one way of confirming the existence of explanations; predictions may be made with or without rational grounds, and some rational grounds adequate for prediction fail to explain the predicted occurrences.²⁵

That there is a difference between explanation and prediction no one would seriously wish to dispute, but that this difference is more than just one of temporal succession between the final event and the initial conditions is questionable, Scheffler's criticism to the contrary. If Scheffler's criticism is mistaken, as I think it is, I suspect it is because he is not using the word "prediction" in the same sense that Hempel is. In his model Hempel has attempted to state the necessary logical conditions for satisfactory explanations and predictions. In other words Hempel is using the word "prediction", as well as the word "explanation", in a normative sense. Scheffler, in contrast, is using the word "prediction" in its non-normative sense and this seems to be at least part of his confusion. He frequently tries to substantiate his claim that explanation and prediction are structurally

²⁵ Ibid., p. 298.

distinct by an appeal to the non-normative criteria for the ordinary usage of "prediction". For example, Scheffler maintains that we can speak of the assertions made by clairvoyants and the like, as predictions because this is the non-normative criterion for the ordinary usage of "prediction". In one respect Scheffler is right; we often do claim a usage is correct simply because it is the non-normative criterion for the ordinary usage. However, it is also true that the non-normative criteria for the ordinary usage of a word are not necessarily the correct criteria for the normative usage of that word. It is my contention that this is the case with respect to the word "prediction". The assertions made by clairvoyants, prophets, etc., would, I think, be more correctly labelled as "unsatisfactory" predictions. Scheffler might reply, and rightly so, that in view of my remarks the onus is on me to indicate that the normative usage to which I have alluded, is the correct normative usage of "prediction". Unfortunately, the answer to such a request is not readily available; in fact this entire paper is an attempt to aid giving a satisfactory answer to such a request.

Our inability to give an immediate answer to Scheffler's request does not mean that we must therefore suspend judgment as to whether or not Scheffler's critical remarks are well taken. Beside using the word "prediction" in a sense other than that used by Hempel, there are more serious shortcomings in Scheffler's account. He has argued that a prediction can be false whereas an explanation must be true in virtue of the logical implication that is said to hold between the explanans, which is assumed to be true, and the explanandum. What Scheffler has

forgotten is that there is a difference between the activity of making a prediction and the statement that expresses the prediction made. Only the latter can be spoken of as being either true or false. Nowhere in the exposition of his own theory does Hempel say that he is talking about some sort of activity. On the contrary, he clearly states that he is talking about the logical relation between groups of statements, the logical relation between the explanans and the explanandum. Hence Hempel's statement that the explanandum must be a logical consequence of the explanans. In other words, if the explanans does not logically imply the explanandum then we do not have an explanation. In an explanation we know E (i.e., the explanandum) and the problem is to determine the antecedent conditions and laws from which E will logically follow. On the other hand, in prediction we have certain antecedent conditions and laws and the problem is to determine what true statement can be logically deduced from a conjunction of the statements of these antecedent conditions and laws. That is, the explanandum must be a logical consequence of the explanans; if not, then we do not have a prediction. The logical requirement that a prediction must satisfy is identical with the logical requirement of an explanation. If at some future time E, i.e., the statement expressing the prediction, turns out to be false, then obviously E could not originally have been logically implied by the explanans. Hence, we did not have a prediction in the first place, for one of the conditions that must be satisfied if we are to have a prediction is that the explanans must be true, and if E is false, then obviously the explanans never was true. Thus, in a

prediction where E is false the conclusion that should be drawn is this: At the time of the prediction perhaps an error was made in recording the antecedent conditions, or, because of insufficient knowledge, it was impossible to state all the necessary antecedent conditions and relevant laws which, if we had known them, would have enabled us to make a correct prediction. Scheffler's conclusion that the logical structure of explanation differs from that of prediction is illegitimate.

One further comment remains to be made. Referring to the Hempelian model Scheffler states that it implies "that every explanation, if stated prior to the event described by its explanandum, would be predictive, ...".²⁶ My purpose in drawing attention to this statement is to indicate that we have good reason to assume that Scheffler is aware of the difference between an explanation and an explanandum. An explanandum per se does not constitute an explanation, instead, it is one part of an explanation; it describes the event to be explained. In view of this, what sense are we to derive from Scheffler's remark, that the statement "John F. Kennedy will be elected President in November 1960" does not explain Senator Kennedy's election?²⁷ Scheffler seems to be talking here as though the explanandum is the explanation. Periodically, Scheffler slips into this pattern of thinking about explanations. It is, therefore, not surprising that he should fail, as

²⁶ Ibid., p. 295, my italics.

²⁷ Ibid., p. 296.

we have shown, to distinguish the logical relation between the groups of statements constituting an explanation, from the epistemic conditions that must be satisfied by the statements within each group. Until shown otherwise, I believe we are justified in maintaining that Scheffler's criticisms are based on the confusions I have indicated, and that nothing that has been said would require us to reject Hempel's contention that explanation and prediction are structurally identical.

6. The Scope of the Hempelian Model

Some of the points to be discussed in this section have been previously mentioned; however if we are to understand certain inter-related features of the Hempelian model, some repetition is unavoidable. It will be recalled that the model proposed by Hempel "is restricted to an examination of the causal type of explanation ...".²⁸ As I understand Hempel's formulation of the model certain kinds of explanation are ruled out. For example, a proposed explanation of the fact that a given bird b is black, because all crows are black and b is a crow, is sometimes rejected as inadequate because the "law" (i.e., the universal premise) does not give a causal account of the bird's coloring. All the "law" tells us is "that the color of b's plumage is not an idiosyncrasy of b but is a trait b shares with every other bird which, like itself, is a crow".²⁹ But if we reject such an explanation of why a given bird

²⁸ Hempel and Oppenheim, op. cit., p. 324, my italics.

²⁹ Nagel, op. cit., p. 48.

b is black, then we would also have to reject, for the same reason, certain other explanations which we ordinarily regard as adequate. Thus, we would have to reject the following explanation: For any ideal gas the pressure of the gas multiplied by its volume is proportional to its temperature (Boyle-Charles' law). What we have in this container is gas. Therefore, doubling the pressure for this gas in this container reduces the volume of this gas by one-half. However, the exclusion of this kind of explanation would place a severe restriction on the scope of the Hempelian model. The problem then is, When is an explanation a causal explanation? Hempel is not always clear on this point. He does state that,

"the assertion that a set of events -- say, of the kinds $C_1, C_2 \dots C_n$ -- have caused an event to be explained, amounts to the statement that, according to certain general laws, a set of the events of the kinds mentioned is regularly accompanied by an event of kind E ".³⁰

but this just transforms our problem into another problem, namely, What are we to accept as a general law? These problems are closely related to one another, for whether an explanation is of a causal type depends upon the lawlike statements in the explanans, and I have already referred to some of the difficulties encountered in that area of investigation, the key problem being to state the criterion that will enable lawlike statements to be distinguished from non-lawlike

³⁰ C. G. Hempel, "The Function of General Laws in History," Readings in Philosophical Analysis, H. Feigl and W. Sellars, editors (New York: Appleton - Century - Crofts, Inc., 1949), p. 460.

statements.³¹

It will be convenient at this point to clarify Hempel's position regarding statistical laws or regularities, and to indicate the bearing that his views on the matter have on his thesis that the explanans and explanandum stand to one another in the relation of logical implication.

While ... certain regularities are unquestionably relied upon in (an) explanatory argument, it is not possible to argue convincingly that the intended laws, which at present cannot be stated explicitly, are of a causal rather than a statistical character. It is quite possible that most or all of the regularities which will be discovered as sociology develops will be of a statistical type. ... This issue does not affect, however, the main point we wish to make here, namely that in the social no less than in the physical sciences, subsumption under general regularities is indispensable for the explanation and the theoretical understanding of any phenomena.³²

Note that the position stated in the italicized portion of the above quotation conflicts with the proposed model. Elsewhere, Hempel and Oppenheim remark that in semi-popular explanations in particular the laws in the explanans are not always explicitly mentioned. But in the Hempelian model the relevant laws necessary for the holding of logical implication when the laws are conjoined with the statements of antecedent conditions are explicitly stated. It is suggested by Hempel that the lack of allegedly sufficient precision and generality of these laws could be due to incomplete empirical knowledge of socio-psychological regularities. Nevertheless Hempel and Oppenheim claim that there is no

³¹ See pp. 11 - 13.

³² Hempel and Oppenheim, op. cit., p. 326, my italics.

a priori reason why the model should not be presented as an ideal type. If it is, the ideal limit of generality and precision of the required laws is reached when the relation between the explanans and the explanandum is one of logical implication. In practice, however, the adequacy of an explanation depends upon the degree to which the explanans is confirmed.

Finally it should also be noted that the Hempelian model is "restricted to the explanation of particular events, i.e., to the case where the explanandum, E, is a singular sentence".³³ Explanations of a second kind, namely those of general laws, are mentioned but not discussed in detail (cf. quotation on p. 17 above). The important difference between these two kinds of explanation is clearly indicated by Nagel in his article, The Logic of Historical Analysis:

A theoretical science like physics seeks to establish both general and singular statements, and in the process of doing so physicists will employ previously established statements of both types. Historians, on the other hand, aim to assert warranted singular statements about the occurrence and inter-relations of specific actions: and though this task can be achieved only by assuming and using general laws, historians do not regard it as part of their task to establish such laws. The distinction between history and theoretical science is thus somewhat analogous to the difference between medical diagnosis and physiology, or between geology and physics. A geologist seeks to ascertain, for example, the sequential order of geologic formations, and he is able to do so by applying various physical laws to the materials he encounters; it is not the geologist's task, qua geologist, to establish the laws of mechanics or of radioactive disintegration that he may employ.³⁴

³³ Ibid., p. 345.

³⁴ E. Nagel, "The Logic of Historical Analysis," Readings in the

Thus it can be seen that historical explanations are explanations of particular events. Since the Hempelian model is restricted to the explanation of particular events, it seems as if it is the correct model for historical as well as some scientific explanations (viz. the scientific explanations of particular events). Perhaps it should be noted that I have been assuming that the Hempelian model is the correct model for the physical sciences.³⁵ We can now turn our attention to the claim that the Hempelian model is the correct model for historical and scientific explanations. It is this interesting claim which provides the key problems with which this essay is concerned.

Philosophy of Science, H. Feigl and M. Brodbeck, editors (New York: Appleton - Century - Crofts, Inc., 1953), p. 689.

³⁵ For an interesting account of the possible incorrectness of this assumption, see N. R. Hanson's article "On the Symmetry Between Explanation and Prediction" The Philosophical Review, LXVIII (1959), pp. 349 - 358.

CHAPTER II

HISTORICAL EXPLANATION

1. Introduction

The Hempelian model for scientific explanations is a reformulation of an analysis initially outlined by K. Popper.¹ However, it was not until Hempel presented his version of Popper's views that philosophers of history and historians became actively concerned with the problems of historical explanation. Since then, there has been constant disagreement as to whether or not historical explanations "fit" the Hempelian model. Some philosophers of history and historians have argued that since the natural sciences are the established exemplification of scientific method (and hence objective), if historical methods are to be called "scientific", then they must conform to the scientific method of the natural sciences. Other philosophers of history and historians have attempted to defend history's status as an autonomous discipline which employs its own "unique" methods, and to establish its right to such terms as "scientific" and "objective". Typical of the reaction against restricting historical method to what was felt to be an unnatural form, is the remark made by W. H. Walsh in his brief but suggestive book, An Introduction to Philosophy of History.

¹ K. R. Popper, The Open Society and Its Enemies (second edition; Princeton: Princeton University Press, 1950) The first edition was published in 1935.

A process of explanation is essentially a process of deduction, and at the centre of it there is thus always something expressible in general terms. But to conclude on such grounds that there can be no special concept of explanation in history is the reverse of convincing.²

Such a reaction is understandable; it is not very comforting to be told that within one's own discipline all the explanations given are either false or incomplete. The criticisms that have been levelled against the Hempelian model have generally been of two kinds: First, it has only a limited application, since there are situations in which the model is inadequate. Secondly, the analysis on which the model is based is itself incorrect. Preliminary to our examination of these criticisms, a brief exposition will be given of the way in which the model is extended to include the social sciences, particularly history.

2. Extension of the Model

Referring to the model he has presented, Hempel categorically asserts that

The preceeding considerations apply to explanation in history as well as in any other branch of empirical science. Historical explanation, too, aims at showing that the event in question ... was to be expected in view of certain antecedent or simultaneous conditions. The expectation ... is not prophecy or divination, but rational scientific anticipation which rests on the assumption of general laws.³

² W. H. Walsh, An Introduction to Philosophy of History (London: Hutchinson's University Library, 1951), p. 23.

³ C. G. Hempel, "The Function of General Laws in History," Readings in Philosophical Analysis, H. Feigl and W. Sellars, editors (New York: Appleton - Century - Crofts, Inc., 1949), p. 463.

At this point in his article, "The Function of General Laws in History", Hempel refers to general laws as "laws in the form of universal conditions".⁴ Granted that they are, it is not unreasonable to maintain that the explanandum can be logically deduced from the explanans. A few pages later, however, Hempel qualifies his claim and admits that

it seems possible and justifiable to construe certain explanations offered in history as based on the assumption of probability hypotheses rather than of general 'deterministic' laws,⁵

In many cases, such probability hypotheses would not approximate to the accuracy of the reasonably well-established statistical laws found in economics and psychology. It follows that whenever statistical laws comprise part of the explanans, the explanandum cannot be logically deduced from the explanans. Such explanations, says Hempel, are incomplete. Further, irrespective of whether the historical or sociological explanation with which we are concerned is "causal" or "probabilistic", the explanation will often be incomplete because the tacitly assumed premises are not made explicit. A causal explanation might also be incomplete because of our inability to formulate the required general laws with

sufficient precision and at the same time in such a way that they are in agreement with all the relevant empirical evidence available.⁶

⁴ Ibid., p. 465.

⁵ Ibid.

⁶ Ibid., p. 464.

Accordingly, an explanation is incomplete in the following circumstances: if (1) the laws presupposed are not made explicit because (a) they are so common or well-known that they are tacitly taken for granted, or (b) they cannot be stated with sufficient precision because of the lack of information pertaining to the antecedent conditions relevant to what is to be explained; and (2) if the explanandum cannot be deduced from the explanans because of the statistical laws contained in the latter. Explanations which are incomplete in either of these ways are referred to by Hempel as explanation sketches.⁷ The value of an explanation sketch is that it suggests the direction in which empirical research should proceed in order to find the statements which would change the sketch into an acceptable scientific explanation. Such research would at least "tend to confirm or to infirm those indications".⁸ In this connection, Hempel makes the further point that an explanation (or explanation sketch) which contains in its explanans a hypothesis or law that is not falsifiable in principle -- for example, that everything is determined by the will of Providence -- is a pseudo-explanation (or pseudo-explanation sketch). The relevance of my earlier remarks concerning the function of prediction should be obvious at this point.⁹

If we accept Hempel's suggestion as to how the model may be extended to historical explanations, what kinds of historical explanations

⁷ Loc. cit.

⁸ Ibid., p. 466.

⁹ See p. 18 above.

might there be? An historical explanation could be any one of three types: It may be (1) complete, (2) incomplete, or (3) false. Thus any given historical explanation is a satisfactory or scientific explanation if its explanandum is logically deducible from its explanans. If the explanans does not logically imply the explanandum, the historical explanation being offered is incomplete. In this case, we can speak of the historical explanation as being satisfactory or reasonable to the extent that its assumptions are confirmed to a higher degree than those of any opposing or competing explanation. And finally, if the explanation contains in its explanans a hypothesis which is unfalsifiable in principle, then it is a pseudo explanation. It is important to realize that there are these three possibilities and that they are all recognized by Hempel.

3. Some Misunderstandings About the Model

I would now like to consider a type of criticism that has been directed against the Hempelian model and which, in view of the remarks in the preceding section, will be seen to stem from a misunderstanding of some of its essential features. Very briefly, the interpretation made of the model by Donagan is that "unless historical explanations satisfy the Hempelian theory, they cannot be verified, and should be condemned as subjective".¹⁰ He argues that if historians are to use

¹⁰ A. Donagan, "Explanation in History," Mind, LXVI (1957), pp. 148.

general laws of human behaviour they will be dependent upon the social sciences which establish such laws. But, "the social sciences have not established any genuine laws".¹¹ Consequently, historical explanations cannot contain any general laws. According to the Hempelian model, however, a genuine explanation must subsume the event to be explained under a general law. Donagan concludes, therefore, that most historical explanations will turn out to be either false or imperfect.¹²

Donagan has argued that since there are no genuine laws in the social sciences, there are, therefore, no historical explanations which are cases of subsumptions of particular events under general laws. But to insist on the use of only general laws, would be to leave statistical laws out of account, and Hempel, as we have seen, explicitly admits that some, or even most, historical explanations may be based on statistical laws.¹³ Donagan's attack on the extension of the Hempelian model is based on a narrow and incorrect interpretation of Hempel's views.

Another misrepresentation of Hempel's account of explanation occurs in Lucas' paper "Explanations in History".¹⁴ His interpretation of the Hempelian model is as follows:

¹¹ Ibid., p. 164.

¹² Ibid., p. 149

¹³ See pp. 15 - 16 above.

¹⁴ P. G. Lucas, "Symposium: Explanations in History," Proceedings of the Aristotelian Society, Supplementary Volume XXX (1956), pp. 177-196.

this A is B; but all A's are B;
therefore it is all right for this A to be B.¹⁵

In terms of a specific example the argument would be: this swan is white; but all swans are white; therefore it is all right for this swan to be white. On Lucas' suggested interpretation "This swan is white" is merely a single instantiation of the law "All swans are white". What Lucas seems to be unaware of is that Hempel does not claim that the law by itself explains why this bird, which is a swan, is white. Nor does Hempel maintain that the law alone explains why this bird is a swan or why this bird is white. Instead, Hempel interprets the law as a universal conditional that enables us to explain, given that we have a bird and that it is white, why it is white. We can therefore conclude, I think, that Lucas' argument is based on a serious oversimplification of the Hempelian model and in no way affects Hempel's claim that his model is an adequate analysis of scientific and historical explanations.

In this section I have tried to indicate how important it is for Hempel's critics to be as clear-headed as possible about the position they are attacking. If they were, many misplaced criticisms would be avoided and they would then be able to concentrate on some much more relevant and crucial difficulties. They might consider, for example, whether Hempel's analysis is itself faulty. The major frontal attack on Hempel's own analysis has been made by William Dray in his book

¹⁵ Ibid., p. 185.

Laws and Explanation in History.¹⁶ It is Dray's criticism of the Hempelian model that I shall examine in the remainder of this chapter.

4. Dray's Criticism of the Model

Dray's professed aim is to convince us that we ought to abandon the view that (1) historical explanations consist of statements of initial conditions and explicit or implicit laws, and (2) that the event to be explained is logically deducible from the conjunction of the statements of initial conditions and the laws. Some explanations, Dray points out, are not given in answer to the question "Why?" but rather in answer to the question "How?". The historian, who is interested in answering the question "How?", need not show how the explanandum happened necessarily. In some contexts an adequate explanation can be given by merely showing the explanandum to "have been possible; there is no need to show that it was necessary as well".¹⁷ He gives the following example:

An announcer broadcasting a baseball game from Victoria, B.C., said: 'It's a long fly ball to centre field, and it's going to hit high up on the fence. The centre fielder's back, he is under it, he's caught it, and the batter is out.' Listeners who know the fence was twenty feet high couldn't figure out how the fielder caught the ball. Spectators could have given them an unlikely explanation. At the rear of centre field was a high platform for the scorekeeper. The centre fielder ran up the

¹⁶ W. Dray, Laws and Explanation in History (London: Oxford University Press, 1957)

¹⁷ Ibid., p. 157.

ladder and caught the ball twenty feet above the ground.¹⁸

In explaining how the catch could have happened,

we rebut the presumption that it could not have happened by showing that in the light of further facts, there is after all no good reason for supposing that it could not have happened.¹⁹

To explain how, we need only supply further additional facts; no appeal to general laws is necessary.

What are we to say of this? One indication that this argument does not seriously damage the "covering law" model, is that in the example above, the event to be explained -- the catch -- if explained in terms of a statistical law, would also show that the catch was possible. In other words, if the statistical law has been confirmed to a high degree, there is no reason for thinking that the catch could not have been made. Though Dray seems at times to be fully aware of the fact that on Hempel's model the inference from the explanans to the explanandum is not always necessary but may be only highly probable, in the above example Dray ignores this possible interpretation of the model and therefore his criticism lacks any real force.

But what are we to say of Dray's argument if we interpret the Hempelian model (incorrectly) strictly in terms of general laws? In the illustration the explanans consists of statements about a ball player, a centre fielder who is running after a ball, along with other statements

¹⁸ Ibid., p. 158

¹⁹ Ibid., p. 161.

informing us of the fact that there is a platform in centre field, that it is located in a certain area, that it is of a certain height, and so on. The explanandum is, "The centre fielder caught the ball". But what, we can ask, is the connection between the statements in the explanans and the statement in the explanandum? Perhaps a sudden strong gust of wind slowed the ball's flight so that it dropped at the fence. The question is, Why are these statements in the explanans and not others? Surely it is because implicit in these statements is some such "law" as: "People trained in the activity of catching fly balls, when stationed within a certain distance from the point where the ball is coming down, and when not hindered by the sun shining in their eyes, changing wind currents, etc., usually catch the ball." To be sure, Dray's explanation shows the catch to be possible, but then many things are possible; just to show that something is possible, i.e., that something can be done, is not to give an explanation of its occurrence; it has to be shown why its occurrence is possible in the first place. Consider the following example: A pharmacist is instructing a student apprentice to mix a solution of zinc sulphate with a solution of sulfurated potash in order to get a yellowy-white suspension of polysulfides. It is important in this case that a certain order of procedure be followed; the zinc sulphate must be added to the sulfurated potash and not vice-versa. Suppose, then, that the apprentice adds the sulfurated potash to the zinc sulphate and consequently does not get a suspension of polysulfides. He then asks the pharmacist why he did not get the desired result. On Dray's account the pharmacist's explanation would be, "You mixed the two

solutions together in the wrong order". True, it is possible to get the wrong result if the proper order of adding is not followed, but to tell the apprentice this is not very enlightening; the apprentice knows that this is possible for this is precisely what happened. The pharmacist's explanatory statement would be satisfactory if the apprentice knew the relevant laws of chemistry; if he does not know the laws (which obviously he does not, otherwise he would not have made the mistake he did) then the pharmacist's statement would have to be conjoined with other statements of the appropriate laws of chemistry in order to provide a satisfactory explanation. Dray is therefore mistaken in suggesting that a mere addition of further facts is sufficient; an appeal must be made either explicitly or implicitly to some further law if the demand for a satisfactory explanation is to be satisfied. And when this demand is satisfied the explanation is in accordance with the Hempelian model. Dray's reply to these comments would be, I suspect, that if these remarks are correct, they apply only to a situation in the field of chemistry. But his own concern is with historical explanations and historical laws, and not with chemical explanations and chemical laws.

In summary, we may say that Dray has not shown that the question "How?" cannot be adequately analyzed in terms of the Hempelian model. But as we stated at the beginning of this essay, our primary concern is with those explanations that are given in answer to the question "Why?". Let us, therefore, consider Dray's criticisms of the Hempelian model when it is used in historical explanations that are proffered in answer

to the question "Why?".

Dray's thesis is simply that the Hempelian model is an inadequate model for historical explanation. But before we can evaluate not only Dray's criticism of Hempel's model but also his own account of what constitutes a satisfactory historical explanation, we must first be clear about Dray's interpretation of the Hempelian model. How then does Dray interpret the Hempelian model? In Dray's view the Hempelian model "makes use of the notion of bringing a case under a law, i.e., "covering" it with a law".²⁰ Since laws play such an important role in the Hempelian model, Dray quite rightly begins his critical analysis by noting that it is difficult to state the exact manner in which the alleged law functions. He finds that when the proponents of the model speak of the role of the covering law they use such different phrases as "tacitly used", "guiding", "by virtue of", and "bearing upon". Similarly, when speaking of the covering law itself, an equally wide range of expressions, such as "a statement of a testable universal conditional", "probability hypothesis", "causal law", "law of nature", "generalization", and even "rule" is used.²¹ At this stage of his criticism Dray is focussing attention on this varied and confusing terminology in order to indicate the difficulties involved in seeing "clearly whether the model is sound -- and indeed, exactly what its claims are".²² Are we to think of the

²⁰ Ibid., p. 1.

²¹ Ibid., p. 23.

²² Ibid., p. 24.



law as a generalization, a rule, or in still another way? Besides the interpretation of the required law, Dray is also concerned with the number of laws that may be employed in any particular explanation. As Dray interprets the covering law model throughout most of Chapter II, it requires that an explanation be covered by a single law, i.e., by one and only one law.²³ At the end of Chapter II, he remarks that historians seldom, if ever, arrive at their conclusions by presupposing just one simple law. Hence

The covering law claim would now be that a satisfactory explanation would have to specify conditions and laws such that from the 'conjunction' of statements listing both conditions and laws the occurrence of what is explained could be deduced.²⁴

But that historians nearly always presuppose more than just one simple law in arriving at their conclusions, is a fact which is acknowledged by adherents of the Hempelian model. As a matter of fact, Dray's interpretation of the Hempelian model in the last quotation is in complete agreement with Hempel's original statement of the model. Oddly enough, Dray himself raises the question as to whether his earlier interpretation does not create a "straw man". He states candidly that he believes the latter interpretation to be the more realistic position from the methodological point of view.²⁵ He also admits that Hempel's statement

²³ Ibid. Dray refers to the Hempelian model as "the covering law model".

²⁴ Ibid., p. 55, my italics.

²⁵ Ibid., p. 25.

of the model is the most careful and detailed account that has been given. It is surprising, therefore, to find Dray concentrating on the claims of an inferior and unrealistic model of the logical structure of scientific and historical explanation. His analysis of an inferior model is particularly surprising because Hempel makes it abundantly clear that his position is precisely that expressed by Dray in the last quotation.²⁶ Later on, however, Dray claims that both interpretations are incorrect, though his arguments for dismissing the proper Hempelian interpretation are not very cogent.

After professing ignorance of precisely what is meant by a covering law, Dray suggests that the answer to the question, Do historical explanations require reference to a law? can be found by examining a particular request for a historical explanation. Using Gardiner's example, Dray asks us to consider the following request for an historical explanation: Suppose an historian is asked, "Why did Louis XIV die unpopular?" Suppose further that the historian replies, "Louis XIV died unpopular because the policies he pursued were detrimental to French national interests".²⁷ How would a philosopher like Hempel go about supporting or demonstrating his claim that a law is

²⁶ I do not wish to imply that Hempel is lucid and clear on all points of interpretation. Indeed, I will later indicate certain aspects that are not at all clear, but on this particular point he is clear about the number of laws involved in causal explanations.

²⁷ P. Gardiner, The Nature of Historical Explanation (London: Oxford University Press, 1952), pp. 96 - 99.

implicit in this explanation? This is the problem. What is the answer? Dray claims that two different but related arguments are usually advanced in defence of the Hempelian thesis. The first argument is that even when the historian's explanation mentions no laws, if his explanation were challenged in a certain way, he would be forced to defend his explanation by reference to some law. This general argument is in turn supported by three specific arguments, which I shall refer to as (1) the argument from meaning, (2) the argument from generalization, and (3) the argument from uniqueness. The second general argument mentioned by Dray, I shall, for lack of a better name, refer to as simply the "other argument". It is this "other argument" that I shall examine first.

In Dray's own words, the "other argument" often advanced is that the explanation given requires a law in a logical rather than methodological sense of 'requires'. ... Some philosophers take the tough-minded view that an explanation entails its corresponding law. This claim should be distinguished from the claim ... that the statement that an explained event occurred is entailed by its covering law together with statements of the relevant antecedent conditions. The present claim is that from an explanation a covering law can be deduced, not that from a covering law an explanation can be deduced.²⁸

Hempel, Dray continues,

very nearly makes this claim when he says of a statement of the form: 'The explanation of C is E', that it 'amounts to the statement that, according to certain general laws, a set of events of the kinds mentioned is regularly accompanied by an event of kind E'.²⁹

²⁸ Dray, op. cit., n. pp. 26 - 27.

²⁹ Ibid.

It is not at all clear to me what Dray means in these two quotations. Before stating my criticism of these passages, I shall quote Hempel's remarks immediately preceding those quoted by Dray, in order to be certain that we have a clear understanding of Hempel's view. Hempel's formulation is as follows:

The explanation of the occurrence of an event of some specific kind E at a certain place and time consists ... in indicating the causes or determining factors of E. Now the assertion that a set of events -- say, of the kinds $C_1, C_2, \dots, C_n$ -- have caused the event to be explained amounts to the statement that, according to certain general laws, a set of events of the kinds mentioned is regularly accompanied by an event of kind E.³⁰

Keeping in mind these remarks by Hempel let us carefully examine the first of the above three quotations with a view to clarifying the "other argument" referred to by Dray. Except for the last sentence -- "The present claim is that from an explanation a covering law can be deduced, not that from a covering law an explanation can be deduced" -- Dray presents a clear and accurate account of Hempel's position. In the last sentence, however, I think Dray is guilty of a serious confusion; he misuses the word "explanation" in referring to the Hempelian model. Hempel uses the word "explanation" to refer to statements C, L, and E, when looked at as a group and in which E stands in a deductive relation to C and L in conjunction. Thus, it makes no sense to speak of deducing a covering law from an explanation, or of deducing an explanation from a covering law. What we can say, however,

³⁰ Hempel, op. cit., pp. 459 - 460.

is that (1) the explanandum, E, can be deduced from the explanans, i.e., from C and L in conjunction, or (2) that an "explanation sketch" entails a covering law. What meaning then are we to give Dray's statement in the second quotation, "The explanation of C is E"? If, following Hempel, we read "C" as "a description of antecedent circumstances", and "E" as "the particular event to be explained", then Dray's statement "The explanation of C is E" reads: "The explanation of certain antecedent circumstances is the particular event to be explained" -- which is unintelligible. But perhaps the point Dray is attempting to convey will become clear if we consider Gardiner's example of an historical explanation mentioned above. The question is, "Why did Louis XIV die unpopular?" The answer given is, "Louis XIV died unpopular because he pursued policies that were detrimental to his country's interest". The explanandum, E, is "Louis XIV died unpopular"; the law, L, is "Rulers who pursue policies detrimental to their country's interest are unpopular"; the antecedent conditions, $C_1, C_2, \dots C_n$, are "France's involvement in a war", "Religious minorities were persecuted", and so on. The statement, "The explanation of C is E" would now read, "The explanation of France's entanglement in a war, of the persecution of religious minorities, and so on, is the unpopularity of Louis XIV at his death". What this statement means I do not know; under no interpretation of the Hempelian model can we understand Dray's statement as a criticism directed at Hempel's analysis.

It would seem then, that Dray's "other argument" is unintelligible. I can only conclude that Dray's attempted criticism of the Hempelian

model by means of the "other argument" is not cogent. If Dray is to discredit the Hempelian model as the model for historical explanations, the only means at his disposal is a critical analysis of the arguments advanced by covering law logicians in support of their view that historical explanation tacitly appeal to laws of some kind. It is to Dray's critical analysis that I now turn.

5. The Argument from Meaning

The position attacked by Dray is that the historian, if his explanation were challenged, would be forced finally to defend his explanation by reference to a law. One of the conditions that an explanation must satisfy, according to the Hempelian model, is that it logically entail³¹ what it is supposed to explain; the "explanation" would otherwise be consistent with a number of alternative possibilities, i.e., the explanation must be such that it explains why what is to be explained happened (Louis XIV died unpopular), instead of something else (Louis XIV died of, say, old age). But, Dray argues, to say that "E because C" (Louis XIV died unpopular because religious minorities were persecuted, France was at war, and so on), entails a law (namely, "Rulers who pursue policies detrimental to their country's interest are unpopular"), is an unpalatable claim if by "entails" is meant that it would be self-contradictory to assert C and E, and at the same time deny

³¹ As Dray correctly points out the terminology used here is somewhat confusing. See p. 41 above.

the law, L.³² In other words, "it would be unintelligible for anyone to assert the first and deny the second; a person cannot mean anything by the explanation if he denies the law".³³ Entailment is a semantical relation: thus, "A is a bachelor" entails "A is an unmarried male adult". It would be self-contradictory to assert "A is a bachelor but not an unmarried male adult"; the logical contradiction arises by virtue of the meanings given to the words "bachelor" and "unmarried male adult". Dray's point is that "E because C" does not entail a law in this manner.

Hempel's defence might be simply to deny that "Louis XIV died unpopular because religious minorities were persecuted, France was at war, and so on" is an explanation of why Louis XIV died unpopular. Instead, he might claim that what is presented is really a confirming instance of the law "Rulers who pursue policies detrimental to their country's interest are unpopular", rather than an explanation in terms of the law. For if we were given this "law of unpopularity", and we knew that Louis XIV persecuted religious minorities, etc., then we would be able to deduce that Louis XIV died unpopular. Dray's immediate reply would probably be that such a counter-argument is a deliberate evasion of the point at issue. For the sake of continuity, I shall at present refrain from commenting on what I believe to be the precise point at issue. My only concern at this stage is to clarify Dray's conception of the crucial problem before critically examining his

³² Dray, op. cit., p. 27.

³³ Ibid., p. 28.

positive view of historical explanations.

6. The Argument from Generalization

Referring to Gardiner's example quoted above, Dray maintains³⁴ that if the historian objected that he did not intend to imply that any policy detrimental to a country's interest would make a ruler unpopular, but claimed instead, that it was the unique form which these policies took in this particular case that explains Louis XIV's unpopularity, that the logician would merely incorporate the historian's specifications into the law. The historian might still claim that the "law" was not true on the grounds that, in the case of Louis XIV, his unpopularity depended on still other factors; that some of the policies were not successful, or that Louis XIV personally instigated the policies, and so on. The logician's revised law would then be: "Rulers who pursued policies detrimental to their country's interest, some of which were unsuccessful while the same or others were personally instigated, died unpopular". Any further objections the historian might raise would be similarly absorbed into the logician's law.

Dray draws two conclusions from the above argument. First, it is undoubtedly true that by constant revision a law of such generality would eventually be arrived at that no one, including historians, would seriously deny it. But such a law would be trivially true; the higher the level of generality the more difficult it would become to conceive

³⁴ Ibid., p. 33.

of anything which would be excluded by the law. Further, this difficulty cannot be solved by Hempel by simply reverting to a more modified model where the general laws are replaced by statistical laws or probability hypotheses. For, as anyone who has taken a course in elementary statistics knows, what may be true for the group as a whole upon which the statistics are based, is not necessarily true for every individual within the group. In Dray's own words, the law's "explanatory force does not extend to particular occurrences falling under it".³⁵ Dray's second conclusion is that instead of claiming "E because C" entails a corresponding empirical law, the conclusion to be drawn is this: The statement, " $C_1, C_2, \dots C_n$ then E" is really "the principle of the historian's inference"³⁶ -- the principle in accordance with which the historian could reasonably predict the occurrence of E, given the conditions specified by $C_1, C_2, \dots C_n$. It will be seen later that according to Dray, the historian, instead of appealing to some law as the basis on which a reasonable prediction can be made, appeals instead to his own judgment.

7. The Argument from Uniqueness

The purpose of this argument, like the others we have been discussing, is to show that the Hempelian model does not apply in the

³⁵ Ibid., p. 31.

³⁶ Ibid., p. 36.

field of history. Dray's present argument is directed against Hempel's view that:

... the symbols "E", "C", "C₁", "C₂", etc., ... stand for kinds or properties of events, not for what is sometimes called individual events. For the object of description and explanation in every branch of empirical science is always the occurrence of an event of a certain kind ... ³⁷

But historical explanations very often include accounts of particular happenings, that is to say, individual events. Hence, it follows a priori that historical explanations that attempt to explain unique events do not fit the Hempelian model. Hempel, as Dray points out, tries to avoid this difficulty by admitting that while a posteriori "it is impossible to explain an individual event in the sense of accounting for all its characteristics by means of universal hypotheses ...",³⁸ this does not jeopardize his model, for neither science nor history can "grasp the unique individuality of its objects of study".³⁹ Hempel, Dray correctly argues, misunderstands the way in which historians use such classificatory terms as "war", "revolution", "conquest" and so on; the historian's explanation of the French Revolution is in no sense an application of a general law about revolutions. In explaining the French Revolution the historian is concerned with showing how it differs from any other revolution. Thus, just because some historical events

³⁷ Hempel, op. cit., p. 460.

³⁸ Dray, op. cit., p. 45.

³⁹ Hempel, op. cit., p. 461.

can be classified, it does not follow that their explanation depends upon subsumption under a general law.

The dialectical pattern of argument that has been followed in the last few pages is, I suspect, a bit confusing. One might well wonder if anything more can be said on the problem of what it is to explain something. To maintain that all historical explanations of particular events require an appeal to some general law, has been shown to lead to the undesirable and unrealistic consequence of acknowledging a law of such a high level of generality that the explanation explained too much. In dealing with general or aggregative events, such as wars, revolutions, etc., an appeal to a law has been seen to be inappropriate because it would unjustifiably disregard the way in which historians actually use classificatory terms. On the other hand, if it is maintained that some historical explanations are based on statistical laws, it appears that this is unsatisfactory because the statistical law could also "explain" the non-occurrence of an event. Further, when Dray's own account of explanation is examined, it appears that Dray is making a much stronger claim to the effect that there are no generalizations or laws in an explanation; there are only principles in accordance with which we judge that one event or fact is connected partially or wholly with another. We seem to be in the position where the only reply we can give when asked "Why?", is, "Just because, that's why".

8. Dray's Tough-minded Thesis

Dray's own account of what it is to give an historical explanation arises out of his attempt to provide an alternative to Gardiner's contention, that if a historian's explanation were queried, the historian's only defence would be to fall back on a generalization that his questioner would accept. But, says Dray, what the historian actually does is to mention further "supporting conditions". He will, for example, mention the known beliefs, desires, and ambitions of the people involved, the prevailing economic and political conditions, etc. There comes a stage in the exchange when reference to any further conditions of the situation would be superfluous. It is at this final stage of the historian's defence that his appeal

would be, not to a covering law, but to his opponent's judgment that unpopularity would result from such a set of conditions.⁴⁰

This account of the role played by a historian's "judgment" rests on Dray's view that in giving an explanation, the historian must show, that the historical event to be explained had to happen as it in fact did happen. We are, therefore, not surprised when Dray states that the historian judges that:

the English Civil War was inevitable⁴¹

⁴⁰ Dray, op. cit., p. 51.

⁴¹ Ibid., p. 55.

... in a particular case ... there was a necessary connexion between the event and the circumstances cited to explain it.⁴²

what was done was the thing to have done for the reasons given, rather than merely the thing that is done on such occasion,⁴³

What is surprising, however, is that Dray should feel that the task of the historian, if he is to do his job properly, is to show that what did happen, could not have happened otherwise than it did. Dray, having shown that neither general nor statistical laws entail any necessity in the connection between antecedent conditions and the event to be explained, now seems to suggest that there is a necessary connection, and that it can be known by an exercise of "judgment".

... the connexion could be established by reference to ... other conditions in a determinate situation which allow the judgment that a certain condition was crucial (both necessary and important).⁴⁴

Unfortunately, however, Dray nowhere clarifies his account of this exercise of judgment; nor does he clarify the crucial point of how an exercise of judgment establishes the necessary conditions between one event and another.

Dray does tell us, however, the circumstances in which this faculty of "judgment" is used. Suppose we want an explanation of why some person did what he did. In Dray's view, a satisfactory answer would require a reconstruction of the agent's calculation of the means

⁴² Ibid., p. 158.

⁴³ Ibid., p. 124, my italics.

⁴⁴ Ibid., pp. 105 - 106.

adopted by the agent in order to achieve his ends, given the circumstances in which he found himself. In other words, what the historian wants to know is, What are the agent's reasons for acting as he did? As Dray expresses it, such an explanation "displays the rationale of what was done ...; ... there is an element of appraisal of what was done in such explanations."⁴⁵ The paradigm case of such an explanation (what Dray calls a "rational" explanation) occurs when we can say: "'I find his action perfectly intelligible; he did exactly as I should have done.'"⁴⁶ Of course, says Dray, it may be that the agent is mistaken about the circumstances in which he finds himself, or that the agent's purposes may be quite different from those of the historian in the same circumstances, or even in the circumstances the agent envisaged. Even the agent's own peculiar principles of action may have to be considered in the reconstruction or calculation. Nevertheless, "the action is rationally explained if it is in accordance with the agent's principles -- no matter what we think of these."⁴⁷ It is sufficient for an explanation to show that the agent did have reasons for doing what he did. Not only must the agent's reasons be reasons from his own point of view but they must be "good reasons at least in the sense that if the situation had been as the agent envisaged it ... , then what was done would have been the thing to have done."⁴⁸

⁴⁵ Ibid., p. 124.

⁴⁷ Ibid.

⁴⁶ Ibid., p. 125, my italics.

⁴⁸ Ibid., p. 126.

Dray, anticipating the charge that his claim is unverifiable, states explicitly that his "rational explanation" falls within the realm of empirical inquiry. "Rational" explanations are arrived at through inductive inferences from the evidence, the evidence being dispatches, speeches, letters, etc. On the basis of the evidence at hand, the agent's action can be interpreted in terms of the historian's own conception of rational purposes and principles; for in each case "the inclusion of 'foreign' data in the calculation requires positive evidence that the agent was not like-minded with us".⁴⁹ In other words, unless we have evidence to the contrary, we can judge the agent's actions in terms of normal behaviour. But is not this to generalize?

I suspect that Dray is flirting here with a rather dubious doctrine. Imagine a historian, H, arguing with a philosopher, P, in the faculty club-house. Suppose they are arguing as to why a mutual friend of theirs donated ten dollars to charity. Their debate might be as follows:

- P: Why did A give ten dollars to charity?
 H: His action is perfectly intelligible; I would have done the same thing.
 P: But I am none the wiser for knowing that A did what you would have done. I still want to know why A gave ten dollars to charity. I am not asking why you would give the money to charity.
 H: The reason A did what he did was to avoid being classified in a higher income tax bracket.
 P: I am surprised at A. I would have thought that he gave the money to charity because it was the right thing to do.
 H: But you are assuming that A is a moral person, and since it

⁴⁹ Ibid., p. 130.

is well known that he beats up his small children, you cannot make your assumption unless you have positive evidence to the contrary.

P: Oh, I see, if you were an immoral person you would have made the donation just for the sake of a tax deduction.

H: Yes.

P: You mean then that A had to do what he did; that because you, as an immoral person, would do it for that reason, he, as a matter of fact did do it for the same reason?

H: Yes.

P: But isn't it possible that in this instance A did the right thing for the right reason?

H: No. Given his financial circumstances, his moral values, etc., he had to do what he did.

P: If we could corner A and ask him why he made the donation, and he replied that he did it because it was the right thing to do, what would you say then?

H: I wouldn't believe him; under the circumstances I would not have done what he did because it was the thing to do.

P: But can't you see that what you would have done is completely irrelevant? Just because you would do it is no reason why A should have had to do it, unless of course you have some "deterministic" view of the world.

H: I do not want to hold the position that nothing could have happened otherwise than it did.

P: Then you agree at least to retract your former claim that an 'exercise of judgment' on your part establishes a necessary connection between one event and another.

H: Yes.

P: But there is still another confusion; to be able to give the reasons why a person did something is still not to explain why he did it. There is a difference between giving a reason for x and giving an explanation of x. Mind you, sometimes there is no difference between the two, but sometimes there is.

H: I don't think I understand you.

P: Remember our discussion the other day about the pharmacist and his apprentice?

H: Yes, I remember.

P: Well, the reason the apprentice did not get the desired result is that he mixed the two solutions in the wrong order. As I pointed out at that time, there is a sense in which giving a reason is not the same as giving a fully satisfactory explanation. So you see, it is important that we do not equate the giving of reasons with the giving of an explanation.

H: But in some cases, as you admit, to give the reasons for a person's doing a certain action is to give an explanation of why that person did that action.

P: Unfortunately, you have forgotten another important point.

you may be able to reconstruct the agent's calculations or reasons for doing what he did, but it is something else again to say that your reconstruction is correct, i.e., that your explanation is satisfactory.

H: I realize full well that a relevant reconstruction does not guarantee the correctness of the explanation given. But this is nothing more than the normal hazard of any empirical inquiry. The best that any historian can ever do is to attempt a reconstruction based on his own experience in life, on his education, on the knowledge advanced by others, and so on.

P: In effect, then, your explanation as well as its correctness, is based upon various generalizations about human behaviour.

H: Certainly.

P: I'm afraid that I am now confused. Earlier you argued that historical explanations did not require any appeal to any generalization. It seems to me that we have travelled in a wide circle only to end up where we originally began. The modified version of the Hempelian model claims the same thing. It seems to me, therefore, that the criticisms you have made of the Hempelian model are applicable to your own position.

If all that Dray really means to say is, that before we explain another's action, we must have some idea of what it is like to be complacent, or courageous, or cowardly, or stupid, or frustrated, etc., or that we must know something about human behaviour as a result of our own experience, education, or even intuition, then I do not think anyone would disagree with him. If, however, this is all that he wishes to say, then I do not think we have been told anything new. If, however, he meant to say more than just this, then he is, as I have tried to show in the above dialogue, holding an untenable position.

9. Dray's Tender-minded Thesis.

Dray, in anticipation of just such criticisms as we have made, also advances a less radical view wherein the requirement of "necessity"

is no longer demanded. His more modest claim is as follows:

If Y is a good reason for A to do X, then Y would be a good reason for anyone sufficiently like A to do X under sufficiently similar circumstances.⁵⁰

The important thing to note, according to Dray, is that

this universality of reasons is unlike the generality of an empirically validated law in a way which makes it especially hazardous to say that by giving a rational explanation, an historian commits himself to the truth of a corresponding law.⁵¹

The reason for this is that a law states that people do behave in a certain manner in certain circumstances. Therefore, if one negative instance is found, then the general empirical law must be, if not rejected, at least modified. In contrast, a negative instance of the general type of statement found in a rational explanation, would not necessarily falsify the latter; the withdrawal of such an explanatory statement would not be necessary because it would still explain the actions of those persons who did act in accordance with it. The reason for this is that the general type of statement that appears in a rational explanation is a judgment of the form:

'When in a situation of type $C_1 \dots C_n$ the thing to do is X.'
The 'implicit law' in such explanation is better called a principle of action than a generalization (or even a principle of inference).⁵²

If it is not at once obvious that a generalization would be "better called" a principle of action, the reason is that a distinction is not

⁵⁰ Ibid., p. 132, my italics.

⁵² Ibid.

⁵¹ Ibid.

commonly made between explanations that "apply" empirical laws and those which "apply" principles of action. This confusion, Dray contends, is due to the systematic ambiguity of the word "because" when used in explanatory statements. Sometimes there is no doubt that the explanatory force of "because" is due to an empirical law or to a principle of action; at other times, however, it is not at all clear which of these is doing the explaining. Whether an explanation of some particular item of behaviour is to be interpreted rationally or not will depend in many cases upon the context of utterance of the historian. It is possible, for example, for Gardiner to explain Louis XIV's unpopularity in terms of the Hempelian model without committing any obvious logical error. Nevertheless, a more plausible explanation of Louis XIV's unpopularity can be given in terms of a rational explanation, i.e., by giving a "more detailed description of the aspirations, beliefs, and problems of Louis's subjects".⁵³ The circumstances being what they were for Louis's subjects, their dislike of him was "an appropriate response".⁵⁴ Their subsequent actions, Dray maintains, are not to be explained in terms of being instances of a law, but rather, as being the reasonable thing to have done. Thus, Dray concludes,

if we appeal to 'general knowledge' at all, it is to principles of behaviour rather than empirical generalizations; to knowledge of what to do rather than of what is usually or always done.⁵⁵

⁵³ Ibid., p. 134.

⁵⁵ Ibid., p. 135, my italics.

⁵⁴ Ibid.

I think it is quite clear that Dray wishes to reject the view that an explanation contains or implies either a law or a generalization. His own theory of explanation is in effect a proposal to substitute "principles of behaviour" or "reasons for acting" in place of "laws" or "generalizations". This manoeuvre is supposed to avoid the difficulties inherent in the Hempelian model when applied to historical explanations. It is my contention that Dray's proffered solution is unacceptable for a number of reasons. To begin with, I think his solution rests on a misuse of the word "explanation", and hence, is the product of a misinterpretation of the Hempelian model. Dray seems to think that Hempel is advocating the view that a law per se is what does the explaining. Consequently, he conceives his program to be twofold: (1) to show that laws are not necessarily required in historical explanations, and (2) to show that what is required is a statement which expresses a "judgment" as to the reasonableness or appropriateness of the occurrence referred to in the explanandum. It is in this statement of a judgment that the explanatory force is said to reside; and not, as Hempel claims, in a lawlike statement. To state this point in another way, Dray is trying to replace lawlike statements with what might be called "judgment-like" statements. But even if we have a "judgment-like" statement this does not necessarily mean that we have an explanation. What Dray is unaware of is that, according to the Hempelian model, the explanatory power does not reside in one particular kind of statement, but rather in a group

of statements that stand in a certain relation to one another.⁵⁶ The word "explanation" refers to groups of statements and not to just one particular kind of statement. It is because of this confusion that Dray misconceives the problem of what constitutes a satisfactory explanation. The problem is not to discover a type of statement that has inherent in it some kind of mysterious explanatory power. Had Dray understood that "explanation" refers to a group of statements, he might have realized that the problem of satisfactory explanations was threefold: (1) What are the logical conditions that the groups of statements making up the explanation must satisfy? (2) What are the epistemic conditions that each statement in the explanation must satisfy? (3) What are the psychological conditions that must be satisfied by the person proffering the explanation? In general terms, the problem of satisfactory explanations is to explicate the logical, epistemic, and psychological conditions that must be satisfied before a collective group of statements is said to constitute a satisfactory explanation.

In reply to my criticism, Dray might argue that his remarks about "principles of behaviour" and those concerning the role that "judgment" plays in historical explanations, are relevant to problems one and three respectively above. I shall postpone discussion of Dray's view of the role of "judgment" in explanations until Chapter III; at present I shall concern myself with evaluating Dray's proposal to substitute "principles

⁵⁶ See pp. 24 - 25 and p. 46 above.

of behaviour" in place of "laws" or "generalizations". Accordingly, we may begin by asking what such a proposal would commit us to saying.

Let us consider the answer Dray would give to the question, Why did Louis XIV die unpopular? His reply to such a question would be that for those subjects, in the situation they were in, to dislike Louis XIV would have been the thing to do. It was the thing that ought to or should have been done. But surely this does not qualify as an explanation. When an explanation is asked for we do not ask, as Dray seems to think we do, what to do; nor are we asking what is usually or always done. What we are asking is, Why was so and so done? Why X ought to be done does not explain why X was done. Nor are we satisfied when we are told that that is what always happens, or that everyone does so and so. If you are told in answer to a "Why?" question, that everybody does X, your answer would surely be that that is not even a reason, let alone an explanation of why you should do X. Similarly, to state that a particular act or event, X, is compatible or appropriate with a certain principle of behaviour, is not to provide a "proof" or answer as to why such an event took place. Nor is it sufficient, as I have already made clear, merely to list further additional facts.⁵⁷ I can only conclude that Dray's attempt to replace generalizations by principles of behaviour accomplishes nothing. If generalizations are acknowledged to form an integral part of an explanation, then in any explanation the

⁵⁷ See pp. 39 - 40 above.

conclusion or event to be explained, given the antecedent conditions and the generalization, is necessitated to the degree to which the generalization has been confirmed. Principles of behaviour, on the other hand, are like rules and are neither true nor false, confirmable nor disconfirmable; they are useful or otherwise. One is, therefore, under no compulsion or necessity to accept the proffered explanation; whether an explanation is satisfactory or not would seem to be just a matter of opinion, and this certainly will not do as a reply to the question we have interpreted Dray as attempting to answer above, namely, What are the logical conditions a set of statements must satisfy if they are to constitute a satisfactory explanation?

CHAPTER III

A REFORMULATION OF THE PROBLEM

1. Introduction

I think it is clear from what has been said in the preceding chapters that any theory of explanation which denies that some generalizations or laws are used in explaining why an act or event took place leads to certain undesirable consequences which make it unacceptable. At the same time, it was shown that any theory of explanation which claims that all historical explanations are false, or which claims, on the basis of some unique or gifted insight into the relation of certain events with one another, that whatever happened had to happen as it did, is manifestly inadequate. That there is in some historical explanations an appeal to at least some loosely formulated generalization about human nature is clearly shown in the following typical example:

Just as the immigrant who has prospered in our midst is only too willing to abandon his language, customs, dress, and sometimes even his name in order to appear the more American, so the provincial in the Roman west abandoned his language in favor of Latin, his law in favor of Roman law, his religion in favor of Roman religion. All western Europe became to a certain degree standardized. The analogy with America is, to be sure, by no means perfect, but in substance it is true.¹

On the other hand, whether or not the historian appeals to any laws in the explanations he gives is difficult to say. The reason is that any

¹ J. W. Thompson and E. N. Johnson, An Introduction to Medieval Europe 300 - 1500 (New York: W. W. Norton & Company, Inc., 1937), p. 4.

law would be expressed by a lawlike statement and there seems to be considerable controversy as to what differentiates a lawlike from a non-lawlike statement. Closely connected with this problem is another difficulty, namely, How are we to distinguish between causal and non-causal laws? That there are problems in this area need not concern us at present. What is of concern, however, is that it seems as if, on the Hempelian model, we are unable to explain adequately free or voluntary acts.

It will be recalled that Hempel states explicitly that his model is a model of causal explanations. Further, he makes a special point of arguing that explanations in terms of the motives of individuals are essentially the same as the causal explanations of physics and chemistry.² In Hempel's view, motives are the antecedent conditions which must be linked to subsequent actions by "covering" laws before they have any explanatory force. That is to say, an historical explanation involving reference to an individual's motives, purposes, intentions, etc., does not, as it may at first seem, present any special difficulty. But consider what such a position commits us to say or accept. It means that we should be able to say, "Always in this kind of circumstance a person of this kind must choose such and such"³ a course of action.

² C. G. Hempel and P. Oppenheim, "The Logic of Explanation," Readings in the Philosophy of Science, H. Feigl and M. Brodbeck, editors (New York: Appleton - Century - Crofts, Inc., 1953), p. 328.

³ M. Warnock, Ethics Since 1900 (London: Oxford University Press, 1960), p. 155, my italics.

What the Hempelian model seems to lead to is determinism, i.e., free or voluntary acts cannot be admitted. Why not? The reason is that even if the social sciences were able to provide us with all the laws of human behaviour, we still could not explain why any particular individual behaves or reacts as he does in every circumstance; for on the assumption the individual has free will he could have done other than he did; he could have chosen another alternative. If, in an attempt by Hempel to circumvent this undesirable consequence, it is denied that an individual can ever act freely or make a rational judgment,⁴ then the result of this denial is scepticism; knowledge is impossible. On the other hand, it might be replied that if free will is granted, and we are consequently unable to predict certain items of human behaviour, then we are forced to accept another undesirable state of affairs; any explanation we may give will be inadequate or faulty. If free will is granted then we cannot explain why any particular individual chooses one alternative rather than another; if confronted with two possible courses of action we would be unable to predict the agent's choice of alternatives.

The subtle perplexities and notorious confusions surrounding the whole problem of free will compel me to conclude these brief comments with the suggestion that perhaps we will have to be satisfied with saying that even if we have all the laws of human behaviour, if free will is granted, it is still only probable that a particular person

⁴ A presupposition of rational judgment is that the act of judgment is autonomous.

would act in a certain way on a specific occasion. We would, therefore, be limited to statistical assertions. Finally, it should also be noticed that the difficulties I have mentioned are applicable to Dray's views as well as to Hempel's. Insofar as Dray insists on claiming that it is the job of the historian to show that what happened had necessarily to happen as it did, he is committed to a deterministic view of human behaviour and all the accompanying undesirable implications just noted. At one point Dray goes so far as to condemn anything which fails to bring out this necessity as spectatorism in history.⁵

2. The General Problem

The following question naturally arises: Can anything be said about what it is to explain something without committing ourselves to a position that is either manifestly false, or else is so vague or general, as to be not worth stating? We can answer this question by listing a number of points to which no one has raised any objection. First of all, there is the indisputable fact that some historical explanations appeal to a generalization of some kind. This is clearly illustrated in the example quoted above. If it is granted that there are laws in the social sciences, then, insofar as an historian attempts to explain why men acted as they did in particular historical situations, it is obvious that some historical explanations appeal to laws of some kind. If anyone disagrees

⁵ W. Dray, Laws and Explanation in History (London: Oxford University Press, 1957), p. 150.

with this contention⁶ I think the onus is on that person to demonstrate the impossibility of establishing any genuine laws in the social sciences. Such a demonstration is not to be accomplished by arguing about the practical difficulties to be found in trying to establish laws in the social sciences; what must be shown is the impossibility of establishing such laws. The fact that some persons have attempted to establish some laws within the framework of their respective disciplines, is itself a strong presumption against any attempts to prejudge the possibility of establishing laws in the social sciences on purely methodological grounds. An example of an attempt to state a sociological law is readily available from the work done by Professor Radcliffe-Brown in the field of social anthropology. The following statement appears in what is perhaps his most influential article:

The sociological laws ... that have here been suggested as underlying the customs of unilineal (patrilineal or matrilineal) succession are:

1. The need for a formulation of rights over persons and things sufficiently precise in their general recognition as to avoid as far as possible unresolved conflicts.
2. The need for continuity of the social structure as a system of relations between persons, such relations being definable in terms of rights and duties.⁷

Secondly, I think it can also be stated confidently that the context, in which the event or act to be explained appears, plays an important part

⁶ See pp. 34 - 35.

⁷ A. R. Radcliffe-Brown, "Patrilineal and Matrilineal Succession," Structure and Function in Primitive Society (London: Cohen & West Ltd., 1959), p. 47, my italics.

in any explanation. That historical explanations are based in part upon the general context in which the act or event to be explained appears is undoubtedly true. The following example clearly illustrates this point:

The prime source of all these evils is to be found in the selfish policy of the College of Electors.... If a candidate was uninfluential, if he was not heir to the last Emperor, if he was acceptable to France and the Papacy, if he had no great territorial position in Germany, and, above all, if he was lavish in his promises, then he was likely to be acceptable to the Electoral College. In these circumstances it is not surprising that the highest secular dignity sank steadily during the fourteenth century in dignity and repute.⁸

In summary, we can say that there are historical explanations which appeal to one or more laws or generalizations, or which contain one or the other of these as well as a reference to the context in which the act or event to be explained is to be found. If I may be permitted a conjecture as to the psychological cause of the problems with which this essay is concerned, I think it is that philosophers of science and history find it intellectually unsatisfactory to be able to say no more than what we have just said.

Regardless of the reasons involved, a much broader thesis is usually advanced. Hempel, for example, contends that all scientific and historical explanations have the same logical structure. In Dray's opinion, the claim that an act or event can only be explained if it can be subsumed under a law or a generalization, is upheld in order to

⁸ H. A. L. Fisher A History of Europe (London: Edward Arnold & Co., 1936), p. 338, my italics.

preserve the more important claim that there is an objective standard for determining whether or not a related group of statements constitute a satisfactory explanation. Hence the reluctance of covering law logicians to give serious considerations to the pragmatic and psychological peculiarities of the agent whose actions are to be explained. For example, if there were no objective standard, then in those cases where there is a fairly great variation in the knowledge, intelligence, and the like, on the part of the agents being considered, there would be no point in speaking of a satisfactory explanation. But, according to Dray, in order to envisage an objective standard of what shall count as a satisfactory explanation, we do not have to report to the formal definition of "explanation" advocated by Hempel. If a proffered explanation is considered to be unsatisfactory, the demand for a further analysis of the act or event to be explained is due not to the inadequacy of some law's predictive power, but is instead due to "the unintelligibility of the gross sequence"⁹ as a whole of which the act or event is but a part. In other words, certain pragmatic considerations must be taken into account and when this is done the puzzlement which generated the request for an explanation disappears. Rational explanation, says Dray, is nothing more nor less than the elimination of puzzlement. What the covering law logicians are presenting is a stipulative technical definition of the word "explanation".

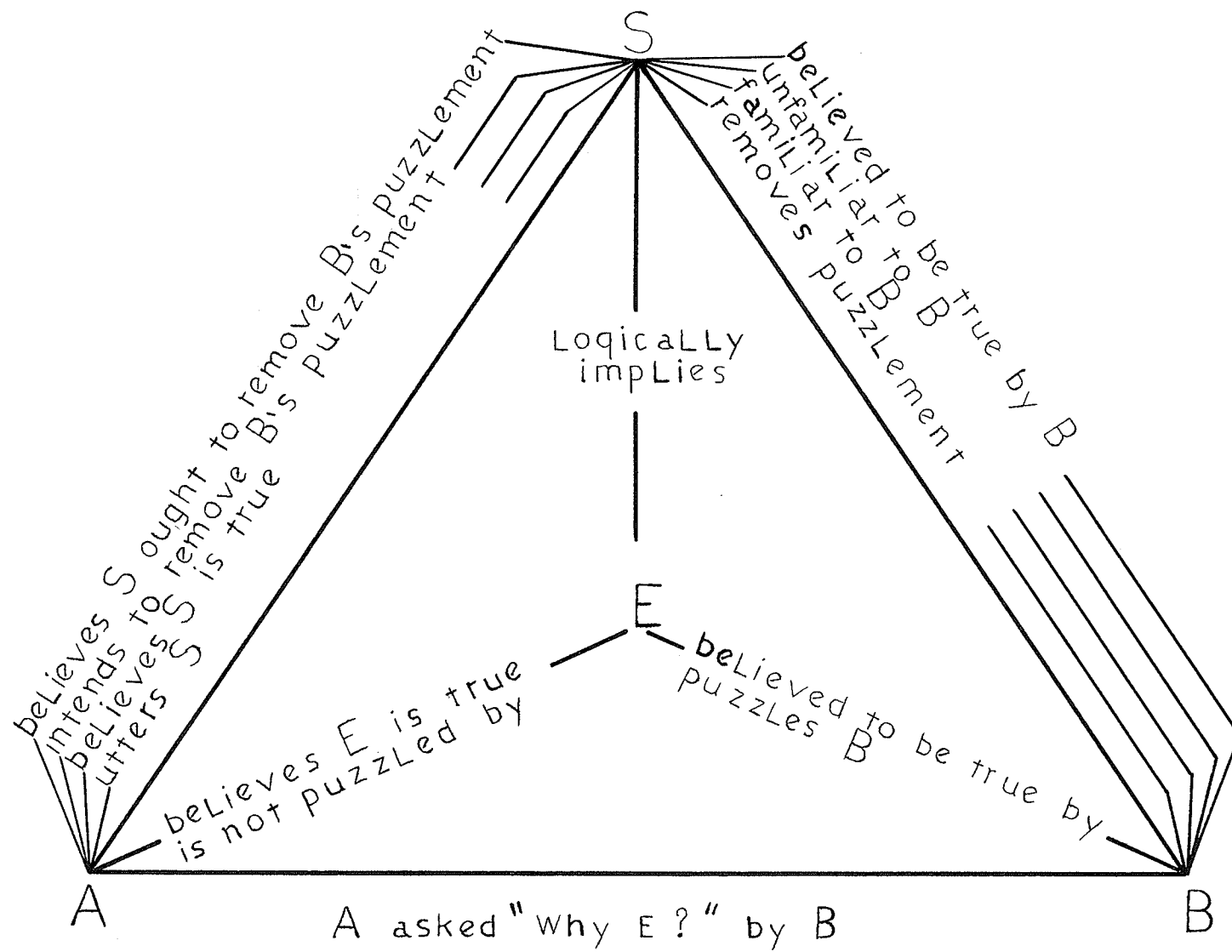
⁹ Dray, op. cit., p. 73.

The point which I wish to make is that in one sense Dray and Hempel are not disagreeing with one another. What Dray is concentrating on is a certain state of mind that is present in two persons when one gives the other an explanation. To satisfy ourselves on this point, we only have to recall Dray's frequent insistence that once an act or event is made intelligible a satisfactory explanation has been given. In contrast, Hempel's concern has been primarily with the logical relations between those statements which, when viewed as a group, make a particular act or event intelligible. Hempel has also commented on the epistemic requirements that the statements comprising a satisfactory explanation must meet. That Hempel and Dray are not in disagreement with one another is borne out by the fact that to say, as Hempel does, "A satisfactory explanation consists of a group of true statements exhibiting an overall deductive relationship", is not the same as saying, as Dray does, "A satisfactory explanation consists of a group of statements that make E intelligible". Similar though these accounts may at first appear, nevertheless Dray and Hempel are not saying precisely the same thing. For to make E intelligible is not necessarily, for Dray, to exhibit an overall deductive relationship. If any third party were nevertheless to assert that Hempel and Dray were saying precisely the same thing then they would be committed to the view that the meaning of the word "intelligible" is "a group of true statements that exhibit an overall deductive relationship". But this is not at all plausible and Dray nowhere suggests that this is the meaning of "intelligible". What is suggested by the accounts of Hempel and Dray is that two different

aspects of the same general problem are being referred to; they are looking at, what I shall call, "the explanation complex" from two distinct, but nevertheless related, points of view. Hempel and Dray are concerned with two separate problems within the area of the general problem of explanation and the problem, as I conceive it, is to show how the required logical, epistemic, and psychological conditions "fit" together to form a complete and satisfactory explanation.

The diagram on the next page illustrates the typical explanation complex where A, the explainer, explains an event to B, the explainee, by means of an explanation and where the explanation is given in terms of the Hempelian model. In our diagram, E, the explanandum, is the event at time T_1 that is to be explained. S, the explanans, consists of certain laws and a set of statements of the initial conditions that occurred at time T_2 . Finally, S and E stand to one another in a deductive relationship. As our diagram clearly indicates, the explanation complex consists of four terms B, A, S, and E. We can analyze the relationship (1) between A and S, (2) between S and B, (3) between S and E, and (4) between A and B and E. The simplicity of our original question, What is it to explain something? is now seen to be deceptive; it is not at all obvious from our original question that a complete explanation should be given by means of a four term explanation complex. The correct formulation of the question is: What is it for A to explain an event to B by means of a group of statements?

Our diagram makes it evident that Hempel has concentrated on the logical and epistemic problems that have arisen from an analysis of the



relation between S and E. Dray, on the other hand, has concerned himself with the state of mind of both A and B with respect to S and E. Insofar as each has investigated a different aspect of the explanation complex they are not in disagreement with one another. Any disagreement between the two arises only when one or the other, or both, insists that his analysis concerns the complete explanation complex. The numerous confusions, misplaced criticisms, and counter-arguments that have been discussed throughout this essay have been due to a failure to recognize the different but overlapping aspects of what it is for one person to explain something to another. While it is difficult to separate and analyze some of the problems inherent in explanation, this does not mean that there are no problems that can be analyzed in isolation. What the diagram does illustrate is that we should be clear as to which specific aspect or problem is being discussed. Thus, some of the questions that might be asked, in an attempt to state the necessary and sufficient conditions that a satisfactory explanation must meet, are as follows:

- (1) Would B have received a satisfactory explanation if the terminology in S were unfamiliar to him?
- (2) Would B have received a satisfactory explanation if A did not know S to be true but nevertheless believed S to be true?
- (3) Would B have received a satisfactory explanation if S were as a matter of fact false but was believed to be true by both A and B?
- (4) Would B have received a satisfactory explanation if A did not intend S to remove B's puzzlement but S did in fact remove B's puzzlement?
- (5) Where S consists of singular statements and where it is claimed by

A that in S a law or generalization is tacitly being appealed to, in what way is the law or generalization implied by the singular statements in S?

Numerous other questions come readily to mind but the list of questions above aptly illustrate the general point I wish to make; they are merely examples of the typical kind of question that would have to be considered in any investigation of the necessary and sufficient conditions of satisfactory explanations. Such questions clearly indicate the particular aspect of the explanation complex that is being investigated in contrast to the vague question, What is it to explain something? For example, question five above, is restricted to a problem that arises from an analysis of the relation between S and E when S consists of statements of a particular type, namely, singular statements. This question highlights a particular difficulty that arises when we consider only the logical requirements that a satisfactory explanation must satisfy, i.e., when we concentrate only on one aspect of the explanation complex, namely, the relationship between S and E.

It will be remembered that Hempel puts forward as one of the conditions for a satisfactory explanation, the logical requirement that the explanans must logically imply the explanandum. Consequently, it would be a contradiction to assert C and E and at the same time deny the law L. Further, Hempel claims that in those cases in which the law or generalization is not explicitly stated in the explanans, the law is always implicit or implied. Nagel has supported Hempel's claim in terms

of a plausible analysis of a particular historical incident.¹⁰ He considers the attempt by the historian Trevelyan to explain why the first Earl of Buckingham, who early in 1623 had been a strong advocate of the proposed marriage between the young Prince Charles and the Spanish Infanta Maria, later became a leading opponent to the plan. The question is, Why did Buckingham change his attitude?

Some of the occurrences described in Trevelyan's narration and listed by Nagel are:¹¹

- C₀ The marriage between Charles and the Infanta was desired by Buckingham.
- C₁ Various circumstances frustrated the early realization of Buckingham's desires.
- C₂ The delay made Buckingham impatient.
- C₃ Buckingham decided to personally fetch the Infanta from Spain.
(Since the intervening occurrences, C₄ - C₁₀ inclusive, are irrelevant with respect to the difficulty to which I wish to draw attention I shall omit them.)
- C₁₁ Buckingham was aware of the Englishmen's hatred of the Spaniards as well as the antagonism of the Spanish.
- C₁₂ Buckingham changed his mind about the desirability of the marriage and opposed the marriage plans.

¹⁰ E. Nagel, The Structure of Science (New York: Harcourt, Brace & World, Inc., 1961), pp. 564 - 568.

¹¹ Ibid., p. 565.

By "filling in" the temporal gap between C_0 and C_{12} Trevelyan has, according to Nagel, satisfactorily explained why Buckingham changed his attitude. The problem though is to show in what way the introduction of each singular statement contributes to the explanation of Buckingham's change of attitude. The first point is that C_0 and C_1 , on the basis of the information given in Trevelyan's narrative, are both to be viewed as "brute facts". Once C_0 and C_1 are assumed,

we possess reliable grounds for expecting that C_2 will also take place if we accept as sound the assumption (let us designate it for future reference by ' $L_{01,2}$ ') that in general men become impatient when they believe their plans are repeatedly frustrated by persons whom they dislike. Accordingly we are able to account for C_2 . Moreover ... the explanation has the probabilistic structure¹²

Analogous explanations are given for the other occurrences C_2 through to C_{12} . Thus, C_{12} can be explained if we suppose

that C_{11} has already occurred as well as that there is some well-founded generalization $L_{11,12}$ about men's responses to conditions such as those present in C_{11} -- for example, the generalization that most men, believing themselves and their own kind to be disliked by a foreign group, and sensing also the hatred with which members of their own kind reciprocate that dislike, themselves develop strongly antagonistic attitudes toward that group.¹³

As Nagel's explication of Trevelyan's explanation stands, it offers an excellent example of a criticism mentioned earlier regarding the inadequacy of statistical laws as explanatory hypotheses. The criticism is simply this: Granted that $L_{01,2}$ and $L_{11,12}$ are true of most men, the

¹² Ibid., p. 566, my italics.

¹³ Ibid., my italics.

point at issue still remains, namely, are they true of Buckingham?

My purpose in citing Nagel's illustration of a historical explanation is not merely to illustrate an earlier criticism. It is also to illustrate a certain further difficulty that can be brought out by means of the following question: In what way are the generalizations or laws $L_{01,2}$, $L_{2,3}, \dots$, $L_{11,12}$ implied by the singular or particular statements C_0 , C_1 , C_2 , $\dots$, C_{12} ? The question can be asked in more comprehensive terms: If it is claimed that a law or generalization is implicit where the explanation consists only of singular statements, in what way is the law or generalization implicit? It may be that by "implicit" is meant that a singular statement in an argument could not be known to be true unless a certain law or generalization were first known to be true. In this use we would say that the truth of the singular statement presupposes the truth of the law or generalization. In what other way can we say that one statement implies another? Neither Hempel nor Nagel tell us what they mean by the word "implicit" when they discuss explanations consisting of only singular statements; neither of them seems to be aware of any of the difficulties -- such as the one I have just mentioned -- that arise when an attempt is made to answer the questions above.

In the discussion above I have attempted to illustrate how the fifth question in our list might arise. I now wish to leave aside Hempel's area of interest and consider some of the difficulties that would confront anyone whose interests were similar to those of Dray and who would therefore attempt to answer some of the other questions in our

list. The diagram above suggests certain possible criteria that must be met if the word "explanation" is to be used correctly in its normative sense. Thus a group of statements, S, made by A, is, according to my proposals, an explanation if and only if:

- (1) A offers or utters S in response to a question -- Why so and so? asked by B.
- (2) A believes S is true.
- (3) A intends S to remove B's puzzlement over E.
- (4) A believes S ought to remove B's puzzlement over E.
- (5) S is familiar to B.
- (6) S is accepted as true by B as a result of A's remarks.
- (7) S is true.
- (8) S ought to remove B's puzzlement over E.
- (9) S logically implies E.
- (10) E is believed to be true by both A and B.

In interpreting these criteria a number of important distinctions should be kept in mind. The first point to notice is that I have suggested ten necessary, but not sufficient, criteria for a complete explanation. One point that we must be clear about is that the meaning of a normative word is not identical with the correct usage of that word. For example, when A says to B "The explanation of E is ..." he does not mean only that he believes S is true, that S is familiar to B, and so on; something more is intended. When these criteria are satisfied B is rationally obliged to accept A's statements as a satisfactory explanation. However, the criteria I am proposing clearly do not entail that B's

puzzlement, which occasioned the request for an explanation, is removed; at best the criteria entail that S is intended to, believed to, or ought to remove B's puzzlement. Of course if B were a completely rational person, and these criteria were satisfied, then his puzzlement would be removed.

Another criterion, I have suggested, that must be satisfied in a complete explanation is that S is true. It is important to realize that neither A's belief nor his assertion that S is true entails by itself that S is a satisfactory explanation. The significance of the difference between believing or asserting something to be the case, and something's being the case, is not always fully appreciated. Suppose that S is, as a matter of fact, false but that A believes S is true. Notice that what we have here is an example of a factual error and not a linguistic error; A believed he was using the word "explanation" in accordance with the criteria for the correct normative usage but nevertheless his belief is mistaken and he has failed to give a satisfactory explanation -- the seventh criterion has not been satisfied.

Many further questions concerning the criteria I have proposed remain to be asked; and much further work remains to be done. Nevertheless, on the basis of my preliminary examination of the topic, I think it would be fair to claim that at least the following points have been established: the non-normative meaning of "explanation" is one thing, the criteria for the correct normative usage of "explanation" is another, and the logical structure of a satisfactory explanation is yet another. As we have seen, however, writers on the topic of explanation do not

clearly distinguish their problems from those of their adversaries. Consequently, they often tend to argue at cross-purposes. It should be obvious that before a problem can be solved we must first know what the problems are. My main purpose has been to formulate in the clearest possible terms the key problems in the area of explanation and to show where these specific problems "fit" in the overall explanation complex.

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