Scientific Explanation and Moral Explanation*

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Abstract

Moral philosophers are, among other things, in the business of constructing moral theories. And moral theories are, among other things, supposed to explain moral phenomena. Consequently, one's views about the nature of moral explanation will influence the kinds of moral theories one is willing to countenance. Many moral philosophers are (explicitly or implicitly) committed to a deductive model of explanation. As I see it, this commitment lies at the heart of the current debate between moral particularists and moral generalists. In this paper I argue that we have good reasons to give up this commitment. In fact, I show that an examination of the literature on *scientific* explanation reveals that we are used to, and comfortable with, non-deductive explanations in almost all areas of inquiry. As a result, I argue that we have reason to believe that moral explanations need not be grounded in exceptionless moral principles.

I. Introduction

As far as theories of *scientific explanation* are concerned, we can aptly describe the story of the 20th century as "The rise and fall of the D-N (Deductive Nomological) model of explanation." The debate over the nature of scientific explanation has occupied center stage in the philosophy of science throughout the second half of the 20th century, and much of this debate has been shaped by Hempel's pioneering work on the topic, starting with his (1942) 'The Function of General Law in History', Hempel and Oppenheim's (1948) 'Studies in the Logic of Explanation', and Hempel's seminal (1965) 'Aspects of Scientific Explanation'.

The early critiques of Hempel's model in the 50's by William Dray, Michael Scriven, and others, targeted Hempel's attempts to apply his deductive model

of explanation to historical explanation. But from the early 60's and on, philosophers of science have started questioning the adequacy of the deductive model even as an account of explanation in the physical sciences. I believe that it is safe to say that few, if any, philosophers of science today endorse the deductive model of explanation as it was presented by Hempel back in the 40's as an adequate account of scientific explanation.

There are, of course, many important differences between science and moral philosophy. Nevertheless, there is at least one thing they have in common. Moral philosophy, like science, is in the business of *explaining* certain features of the world. Moral philosophers, I take it, construct moral theories in order to explain moral phenomena, in much the same way that scientist construct scientific theories in order to explain natural phenomena. And since moral theories are supposed to *explain* moral phenomena, questions about the nature of explanation are as fundamental to moral theorizing as they are to scientific theorizing.

Given the centrality of questions about the nature of explanation to moral theorizing, it is surprising how little has been written on the nature of *moral* explanation. Even more surprising, perhaps, is how little attention moral philosophers have paid to the progress in the literature on scientific explanation in the philosophy of science. I believe that many moral philosophers endorse (either implicitly or explicitly) a deductive model of explanation, and that this commitment to a deductive model of explanation prevents many of these philosophers from considering seriously a novel approach to moral theorizing that I find quite promising—namely, particularism.

Over the past few hundred years moral philosophers have tried to find and formulate *exceptionless moral principle*s—principles that identify features that all and only morally right actions have in common. *Utilitarianism* and *Kantianism* are paradigmatic examples of such attempts. The thought was that in order to explain the rightness of any particular action we must identify a feature that this action exemplifies that guarantees its rightness. For example, Utilitarians believe that any action that exemplifies the property of utility maximization is morally right. In order to explain the rightness of a particular action, *A*, we have to show that *A* exemplifies the property of utility maximization. And since any action that exemplifies this property is morally right, then so is *A*. Nevertheless despite the continuing efforts of many of the most able philosophers in the past few centuries, exceptionless moral principles have not yet been found.[1]

This persistent failure invites us to examine the presumption that such principles are essential to moral theorizing—a presumption that is widely endorsed but rarely, if ever, argued for. And this presumption, I believe, lies at the heart of one of the most interesting and controversial debates in contemporary moral philosophy—the particularism-generalism debate. As I see it, the debate between *particularists* and *generalists* is best understood as a debate over which *research program* we ought to pursue.[2] Generalists, I

propose, are committed to a research program according to which we must find and formulate exceptionless moral principles in order to provide an adequate explanation of moral phenomena (and especially the rightness and wrongness of actions), whereas particularists are committed to an alternative research program according to which we can explain morality without appealing to exceptionless moral principles. So one key question concerning the particularism-generalism debate, as I understand it, is whether an adequate explanation of morality is possible without an appeal to exceptionless moral principles. If the answer to this question is "No," then we have good reason to abandon the particularist research program. However, if the answer is "Yes," then given that exceptionless (explanatory) moral principles have not yet been found, we will have ample motivation to pursue the particularist research program.

The main question of this paper, then, concerns the nature of explanation in ethics. Must (adequate) moral explanations make use of exceptionless moral principles? In the past few years several ethicists began to explore the possibility of non-deductive models of moral explanation—models of explanation that do not make use of exceptionless moral principles.[3] In this paper I hope to contribute to these efforts by looking more closely at the developments in the philosophy of science on the nature of (scientific) explanation. I argue that there are interesting lessons to be learned about moral theorizing by reviewing the literature on scientific explanation. I proceed as follows. In §II, I examine the most influential presentation of the deductive model of explanation—namely, Hempel and Oppenheim's account—and I show that the claim that explanations must be deductive is asserted but never argued for. In §III, I argue that we have good reasons to believe that not all explanations are deductive. In §IV, I discuss non-deductive models of explanation based on *ceteris paribus* laws, and in §V, I present a few non-deductive models of explanations that do not require laws at all. In §VI, I consider the pragmatic aspects of explanation. Finally, in §VII, I show that giving up on a deductive model of explanation not only undermines principle monism, but it gives us good reason to abandon pluralism as well.

II. Explanation and Exceptionless Generalizations

Since moral theories are in the business of explaining moral phenomena, one's views about moral explanation will influence the kind of moral theories one is willing to countenance. Many moral philosophers in the past few centuries believed that adequate moral explanations must appeal to exceptionless moral principles—as evidenced by their persistent attempts to find and formulate such principles—yet few, if any, argued for this presumption.

The fact that this presumption was accepted without argument does not entail that this presumption was unmotivated. It is plausible, I think, that

the remarkable progress in the sciences spawned by the scientific revolution motivated moral philosophers to search for exceptionless moral principles. The discovery and formulation of scientific laws, and most notably Newton's laws, led to astounding achievements in the sciences. So it may have been natural to expect that if we could find and formulate the "laws of morality," we could, perhaps, accomplish similar advances in ethics. Surely moral phenomena are complex and diverse and it may not appear as though the moral landscape could be captured by a set of simple principles. But then again, prior to the publication of Newton's *Principia* in 1687, the thought that three simple and elegant principles could explain celestial phenomena as well as the behavior of massive objects on Earth was unfathomable. So even those who respect Aristotle's dictum, that "a well-schooled man is one who searches for that degree of precision in each kind of study which the nature of the subject at hand admits" (*Nicomachean Ethics* I.3:1094b24) may insist that although ethics, like science, does not *appear* to be the kind of study that admits of a great deal of precision, it may perhaps, like science, permit of more precision than it seems to allow at first sight—if only we manage to find the correct moral principles.

All this is to say that there were, in fact, good reasons to pursue the generalist research program even though the underlying commitment of this program concerning the essentiality of exceptionless generalizations to adequate moral explanation was never explicitly argued for. Nevertheless, if after a sufficiently long period of time a research program fails to provide the results one had hoped it would deliver, one may well question its fundamental commitments. And since we have not yet managed to find and formulate satisfactory exceptionless explanatory moral principles, the generalist research program has, so far, failed to provide an adequate account of morality. So we should now ask whether there are any arguments in support of the generalist presumption, and whether there are any good reasons to object to the particularist commitment that (adequate) moral explanation need not appeal to exceptionless moral principles.

A natural place to look for such arguments is the literature on the nature of explanation. And indeed, the most influential essay in modern discussion of this topic—namely, Hempel and Oppenheim' "Studies in the Logic of Explanation"—provides a detailed model of explanation according to which exceptionless generalizations are essential for adequate explanations.[4] The fundamental insight of Hempel and Oppenheim's model, which is known in the literature as the "covering law model," or the "D-N model," is that to explain a certain phenomenon is to demonstrate that this phenomenon *had to occur*. An explanation, on this model, has the form of a deductive argument. The conclusion of the argument is (a sentence describing) the phenomenon to be explained—the *explanandum*—and the premises of the argument—(the sentences describing) the *explanans*—must logically imply the explanandum.

Moreover, the explanans must include a statement of a general law, and this law must play an indispensable role in the derivation of the explanandum.

Hempel and Oppenheim were interested primarily in the structure of *scientific* explanation. Nevertheless, it seems as though moral philosophers have also endorsed the idea that explanation is subsumptive in nature. John Ladd—one of the few philosophers who explicitly discusses the nature of moral explanation—claims that "the aim of explanation . . . is an ordering of phenomena under general law . . . To the question "Why?," explanations answer by a subsumption under a general statement." (1952:499) In a footnote, Ladd directs the reader to Hempel and Oppenheim's essay for a more precise account of explanation.[5] Since subsumption under general statement is, according to Ladd, the very essence of explanation, he concludes that there are no important differences between the basic pattern of explanation that Hempel and Oppenheim identify in the empirical sciences and the basic pattern of explanation in ethics. "Ethical theory," he writes, "seeks to explain, and therefore uses the methods of explanation which are similar to those of the other empirical sciences such as psychology, physics, meteorology, linguistics, etc." (501)

Now if Ladd and Hempel and Oppenheim are right about the structure of explanation in ethics, then the particularist project is in trouble, because if in order to explain a certain phenomenon we must subsume this phenomenon under a general law, then in order to explain the rightness of action R, we will have to find a general law (or principle) that "covers" R. That is, if Hempel and Oppenheim are right, then an explanation of the rightness of R should have the following form:

1) Action R has feature φ.
2) Every action that has feature φ is morally right. } Explanans
3) (Therefore,) action R is morally right. } Explanandum

Without the (exceptionless) principle stated in line (2), the explanans would not logically imply the explanandum, and consequently, the explanation would be inadequate. So if an explanation that fails to conform to this model is defective, the particularist research program is doomed from the outset.

But why should we think that all explanations must conform to the deductive model of explanation? Ladd, alluding to Hempel and Oppenheim again, claims that explanations "should provide us with statements that have 'potential predictive force.'"[6] And the general laws cited in the explanans afford explanations with predictive power. But Ladd does not explain why we should think that explanations must have predictive force in the first place. Indeed, for Hempel and Oppenheim the fact that "the difference between [explanation and prediction] is of pragmatic character" and 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 considera-tion" (138) are not constraints on a theory of explanation, but consequences of the theory of explanation they propose.

So why do Hempel and Oppenheim think that explanations are subsump-tive in nature? Interestingly, this question is not explicitly answered in their essay. Hempel and Oppenheim tell us that their goal is "to shed some light on [the function and the essential characteristics of scientific explanation] by means of an elementary survey of the basic pattern of scientific explanation." (135) They begin their survey with two illustrations of scientific explanations. The first is an explanation of the initial drop, and subsequent swift rise of the mercury level in a glass thermometer, when the thermometer is rapidly immersed in hot water. "How is this phenomenon to be explained?" they ask. (135) Now this question is ambiguous. It could be understood as a question about how the abovementioned phenomenon is *actually* explained by scientists. Alternatively, it could be interpreted as a question about how this phenomenon *ought to be* explained. And Hempel and Oppenheim seem to shift from the descriptive reading to the normative one.

One might think that this shift from a descriptive reading to a normative reading is innocuous. Naturally, if we are to give an analysis of the concept of scientific explanation, it is a good idea to begin our inquiry with a few paradigmatic samples of scientific explanation—samples that exemplify, as clearly as possible, the components of the proposed analysis. Indeed, one might have though that Hempel and Oppenheim provide paradigmatic ex-emplars of scientific explanation in order to help their readers identify the concept they are trying to give an account of. But surprisingly, the illus-trations Hempel and Oppenheim provide do *not* exemplify the pattern of explanation they propose. In order to see this, it is worth citing their sample explanation, and their analysis of this example, at length. "The increase in temperature," they write,

> affects at first only the glass tube of the thermometer; it expands and thus provides a larger space for the mercury inside, whose surface therefore drops. As soon as by heat conduction the rise in temperature reaches the mercury, however, the latter expands, and as its coefficient of expansion is considerably larger than that of glass, a rise of the mercury level results.—This account consists of statements of two kinds. Those of the first kind indicate certain conditions which are realized prior to, or at the same time as, the phenomenon to be explained; we shall refer to them briefly as antecedent conditions. In our illustration, the antecedent conditions include, among others, the fact that the thermometer consists of a glass tube which is partly filled with mercury, and that it is immersed into hot water. The statements of the second kind express certain general laws; in our case, these include the laws of the thermic expansion of mercury and of glass, and a statement about the small thermic conductivity of glass. The two sets of statements, if adequately and completely formulated, explain the phenomenon under consideration: They entail the consequence that the mercury will first

drop, then rise. Thus, the event under discussion is explained by subsuming it under general laws, i.e., by showing that it occurred in accordance with those laws, by virtue of the realization of certain specified antecedent conditions. (135–6)

Hempel and Oppenheim begin by presenting a possible explanation of the phenomenon in question. Their proposed explanation may well be the answer one would receive from a scientist to the question "How is this phenomenon to be explained?"—First the glass tube expands, causing the mercury level to drop; then, when the mercury heats up, the mercury expands and the level of mercury in the tube rises. Next, Hempel and Oppenheim go on to analyze this proposed explanation. They claim that this explanation involves two kinds of statements: *antecedent conditions* and *general laws*. The antecedent conditions include "the fact that the thermometer consists of a glass tube which is partly filled with mercury, and that it is immersed into hot water." And these features are indeed mentioned in our sample explanation. However, the statements of general laws they identify—"the laws of the thermic expansion of mercury and of glass"—are not mentioned in the sample explanation at all.[7] In claiming that explanations involve statements of general laws, Hempel and Oppenheim are no longer *describing* the sample scientific explanation they have given us; instead they are offering a *normative* account of what scientific explanation ought to look like.

The last two sentences of the cited passage are particularly telling. "The two sets of statements [i.e., *antecedent conditions* and *general laws*], *if adequately and completely formulated*, explain the phenomenon under consideration." The qualification "if adequately and completely formulated" indicates that the sample "explanation" described in the beginning of the paragraph is, in fact, an inadequate explanation; only when the antecedent conditions and general laws are *adequately and completely* formulated, we will have properly explained the phenomenon in question. "*Thus*, the event under discussion," they claim, "is explained by subsuming it under general laws." But the "thus" here is misleading. Hempel and Oppenheim proposed a *reconstruction* of the sample explanation they originally presented as a subsumptive explanation, but they offered no argument to support their claim that "the event under discussion is explained by subsuming it under general law." In fact, if we take the sample explanation at face value, the event under discussion is explained without mention of any general law at all.

There is, of course, nothing wrong with, or unusual about, offering a reconstruction of a sample explanation; it is not uncommon for philosophers of science to try to unmask the underlying structure of scientific concepts like 'scientific explanation' even if this structure is rarely, if ever, explicitly exemplified in scientific discourse. But if this is what Hempel and Oppenheim are doing, then the sample explanation they discuss provides no support for their analysis, nor does it help us to identify the concept they are trying

to analyze. They could have begun their paper by stating their proposed analysis and showing that they can reconstruct sample explanation to fit the explanation schema they put forward.[8]

To be clear, I have not argued that the covering law model is false or even problematic. All I have claimed so far is that we have not yet been given any reason to think that explanations must have a deductive form; despite Hempel and Oppenheim's rhetoric (e.g., "From the preceding sample cases let us now abstract some general characteristics of scientific explanation." (136)) their appeal to sample explanations offers no support for the pattern of explanation they propose, and as far as I can tell, they offer no other argument to motivate their deductive model of explanation.

Now if there were no difficulties for Hempel and Oppenheim's model, and if there were no alternative theories of explanation, we might have had reason to accept this model of explanation—even though Hempel and Oppenheim offer no argument to convince us that this is the correct model of explanation—in virtue of its success, or in virtue of the absence of competing accounts. In the next section I will argue that the deductive model of explanation faces serious problems. In the subsequent sections I will present several alternative models of explanation.

III. Are All Explanations Deductive?

One noticeable difficulty for applying the covering law model of explanation in ethics is that we have not yet managed to find and formulate exceptionless moral principles that can be used in deductive explanations. Lying, for instance, is typically wrong (or wrong-making), but not always.[9] So we cannot *deduce* that an act is wrong from the fact that it involves lying. Usually, an act is right if it brings about the best consequences, but not always.[10] So we cannot *deduce* that an act is right from the fact that it leads to the best consequences.

The absence of exceptionless generalizations that can be used in deductive explanations is not unique to ethics. In the special sciences—e.g., in biology, psychology, economics, and history—scientists have yet to find and formulate exceptionless laws. And since exceptionless laws are not currently available in these disciplines, it follows that if scientists provide any adequate explanations in these fields at all, their explanations conform to an alternative, non-deductive, model of explanation.

Interestingly, Hempel and Oppenheim were well aware of this point, and indeed they claimed that (most) explanations in the special sciences are, in fact, incomplete. To illustrate the incompleteness of explanations in the special sciences, they presented one popular explanation of the severe price drop at the US cotton exchanges in the fall of 1946. The price drop, according to this explanation, was due to the fact that a large-scale speculator began to liquidate his stocks, which was soon followed by many panicked liquidations

by smaller speculators. According to Hempel and Oppenheim, even though general regularities are not explicitly mentioned in this explanation, some general regularities are "referred to" or "implied" by it. For instance, this explanation, they claim, implies "some form of the law of supply and demand," and it relies on "regularities in the behavior of individuals who are trying to preserve or improve their economic position." (141) These laws, they admit, "cannot be formulated at present with satisfactory precision and generality." And consequently, "the suggested explanation is surely incomplete, but its intention is unmistakably to account for the phenomenon by integrating it into a general pattern of economic and socio-psychological regularities." (141)

There are several difficulties with this analysis. First, the fact (if it is a fact) that the proposed explanation "refers to," "implies," or "relies on," several generalities, does not mean that these regularities are a part of the explanation. For example, factual claims "rely on" evidence. But the evidence for the truth of the explanans need not be part of the explanation, even though the explanation "relies on" these facts. Also, the explanans may imply all kinds of statements that are not relevant to the explanation in hand. For example, any explanans trivially implies all tautologies, but these tautologies are not part of the explanation. Moreover, a generalization of the form (1) All Fs are Gs implies that (2) if a is F then a is G, but claim (2) may be irrelevant to an explanation if the explanandum is that (3) b is G. So although (2) is implied by (1) it is not a part of the explanation of (3). Similarly, even if the explanation in question "implies" the law of supply and demand, and "relies on" some psychological regularities, it is not clear that these regularities ought to be included as a part of the explanation.[11]

Second, since the relevant laws and regularities "cannot be formulated at present with satisfactory precision and generality," this explanation fails to satisfy the conditions of adequacy that Hempel and Oppenheim identify— the explanans does not imply the explanandum. So why is this proposed explanation an "incomplete explanation" rather than simply a failed explanation? Indeed, how is it an "explanation" at all? Perhaps the thought is that this "incomplete explanation" is an explanation because it approximates the "real explanation" of the phenomenon in question. In an earlier paper Hempel introduced the notion of *explanation sketches;* an explanation sketch is not a full-fledged explanation, but presumably it could be turned into one:

> What the explanatory analyses of historical events offer is . . . in most cases not an explanation in one of the meanings developed above, but something that might be called an explanation *sketch.* Such a sketch consists of a more or less vague indication of the laws and initial conditions considered as relevant, and it needs "filling out" in order to turn into a full-fledged explanation. This filling-out requires further empirical research, for which the sketch suggests

the direction. (Explanation sketches are common also outside of history; many explanations in psychoanalysis, for instance, illustrate this point.) (1942:42)

Hempel and Oppenheim assume that although explanations in the special sciences are incomplete, they give us some indication as to how they are to be "filled out," or supplemented so as to form *complete* explanations.[12] In the aforementioned example, for instance, the proposed explanation indicates that we need to find an exceptionless formulation of the law of supply and demand, and one or more exceptionless regularities regarding human psychology and motivation in order to obtain a full-fledged explanation.

But a few problems remain. First it is still unclear how explanation sketches explain anything. Since we cannot deduce the explanandum from the explanans in an explanation sketch, then either explanation sketches do not explain, or deduction is not required for explanation. Even if explanation sketches indicate to us what we need to do in order to find a full-fledged explanation, they cannot explain at all if Hempel and Oppenheim are right about the deductive nature of genuine explanation.

A related problem is that at present it is an open question whether there are any strict laws, or exceptionless (explanatory) generalizations, in the special sciences. For example, it is an open question whether we can find and formulate a non-trivial exceptionless version of the law of supply and demand, not to mention (strict) psychological laws, or (strict) historical laws. If it turns out that there are no (strict) laws in the special sciences, then it follows, on Hempel and Oppenheim's account, that these sciences provide no explanations at all—not even explanation sketches.

Finally, it is not clear that explanation sketches always, or even often, suggest a direction for "filling out" explanation sketchs in order to fit the Hempel-Oppenheim schema. Consider, for instance, the following explanation for why Germany declared war on Russia in August 1914.

Archduke Ferdinand, heir to the Austro-Hungarian throne, was assassinated in Sarajevo by a Bosnian Serb on June 28, 1914. As a result, Emperor Franz Joseph of Austria-Hungary declared war on Serbia. Russia, as an ally of Serbia, declared war on Austria, which was followed by a German declaration of war on Russia on August 1, 1914.

Obviously there is a lot more one could say here as part of the explanation of the German declaration of war on Russia. One could elaborate on the socio-political situation in Europe, including the various agreements and power struggles between nations, and in this respect we could think of our proposed explanation as an "explanation sketch." However, it certainly doesn't look like the intention of this explanation is to subsume the event in question under an exceptionless law. It is not clear that this sketch "implies," "refers to," or "relies on" any exceptionless regularity, and this "sketch"

doesn't seem to suggest any particular way for filling it out in such a way that it would fit the Hempel-Oppenheim explanation schema.

As we have seen, for Hempel and Oppenheim explanation sketches are defective explanations—an explanation sketch is merely a placeholder for the "real" explanation that we ought to look for, and it is only explanatory to the extent that it indicates to us how to obtain the "real" explanation. Hempel's line of thought, then, is roughly this: we have made a philosophical discovery regarding the form of proper explanation; explanations in the special sciences do not exemplify this form, and therefore, they are defective.

Other philosophers take a different approach.[13] Many explanations in the special sciences, they claim, are perfectly adequate. But Hempel and Oppenheim's theory of explanation tells us that these explanations are defective. Therefore, Hempel and Oppenheim's account is false. Indeed, since most, if not all, of the explanations given in the special science (as well as many of the explanations given in the physical sciences—including Hempel and Oppenheim's examples) do not exemplify the model of explanation that Hempel and Oppenheim develop, we may doubt whether Hempel and Oppenheim have given us an account of the most important or interesting sense of 'explanation'.

Interestingly, later on Hempel recognized that a deductive model of explanation is not the only model of explanation employed in the sciences. In his (1965) 'Aspects of Scientific Explanation' Hempel developed his *inductive-statistical* model of explanation (IS model) in order to account for explanations based on statistical laws. The explanandum of an IS-explanation cannot be deduced from its explanans; all that can be deduced is that the explanandum is more or less likely to occur. For example, if some law entails that a certain coin is 90% likely to land heads if tossed, we cannot use this law to *deduce* that this coin would land heads when tossed. Nevertheless, we can explain the event of this coin landing heads by citing the fact that the coin was tossed, and that given the relevant law it was 90% likely to land heads. For Hempel, an IS-explanation is successful to the extent that the explanans confers high probability on the explanandum.

For our purposes here, we need not discuss the difficulties for Hempel's IS-model, and the various refinements of statistical explanations offered in the literature.[14] The important point is that Hempel, like many other philosophers, recognized that not all explanations are deductive. And it is hard to see what reasons one could have for thinking that statistical explanation is the only admissible form of non-deductive explanation.

In this section I argued that there are various difficulties for Hempel's deductive model of explanation. Even if Hempel's account captures the logic of explanation in the physical sciences—which is far from obvious[15]—it seems quite clear that it fails to capture the structure of explanation in the special sciences. Moreover, since we have not been given any argument for the claim that explanations are essentially deductive, and given Hempel's own

admission that some explanations are not deductive, we have good reason to explore alternative non-deductive models of explanation.

IV. *Ceteris Paribus* Explanation

According to the D-N model, strict laws are essential for adequate explanations, since without strict laws we cannot *deduce* the explanandum from the explanans. There are several competing views on the nature of laws, but one thing they all agree on is that a strict law is (at least) a universally quantified conditional statement that whenever certain conditions obtain, other conditions obtain as well. Schematically, we can represent strict laws as follows: 'all Fs are Gs'. If we find one instance of (F & $\sim$G), then 'all Fs are Gs' is false—i.e., 'all Fs are Gs' is not a strict law.[16]

Several philosophers, however noted that strict laws are hard to come by—particularly in the special sciences. Pietroski and Rey, for example, write: "it seems that special sciences do not—and, indeed, probably could not—state genuinely exceptionless generalizations." (1995:83) Our current best "laws" in the special sciences are not immune to counterexamples unless we qualify these laws with '*ceteris paribus*' (i.e., 'all thing being equal') clauses. As Lipton observes "Most laws are ceteris paribus laws. If we are being punctilious, what we say is not 'All Fs are G', but only 'All Fs are G, all else being equal'." (1999:155) Similarly, Silverberg claims that "If there are any psychological laws, they would be *ceteris paribus* laws. Between the occurrence of any sort of psychological going-on and any subsequent sort of event, intervening disruptive factors can intrude. Between time $t1$ and later time $t2$ a psychological system might go mad, or die, or the universe might disappear." (201) And likewise, Morreau maintains that

> Hedged laws are the only ones we can hope to find. Laws are commonly supposed to be truths, but interesting generalizations, without some modifier such as 'ceteris paribus', are by and large false. This is so in ethics, in history, and in non-basic sciences: economics, biology, psychology, and the rest. There are reasons to think it so in basic sciences like physics, too. (1999:163)

Setting aside the dispute about the availability of strict laws in the physical science,[17] it is clear that we have not yet found strict laws in many of the special sciences, and that at present we have to settle for *hedged* generalizations or *ceteris paribus* generalizations in those fields. Moreover, some philosophers have even argued that the special sciences are *incapable* of establishing strict laws.[18]

Following Pietroski and Rey and others, I will take as data for any theory of explanation that special sciences like biology, psychology, economics, and history, sometimes provide good explanations even when strict laws are unavailable.[19] This means that explanation can proceed without strict laws.

Nevertheless, one might insist, with Hempel and Oppenheim, that explanation requires subsumption under law. Schiffer (1991) succinctly summarizes this line of thought as follows:

> Some philosophers believe that there are *ceteris paribus* laws and that without them there would be no special-science explanations, and hence no special sciences. These philosophers think that science is in the business of providing scientific explanations, that such explanations require laws, and that there are no, or only very few, strict special-science laws; whence their appeal to *ceteris paribus* laws. (1)

If the business of science is to construct explanations grounded in laws, then the special sciences must find and formulate laws not only in order to provide explanation, but also in order to vindicate their status as genuine sciences. But since we are currently unable to find strict laws in the special sciences, then perhaps we can make do with *ceteris paribus* laws instead. Unlike strict laws, *ceteris paribus* generalizations are *defeasible*, and they can survive exceptions; the statement '*ceteris paribus*, all Fs are Gs' is not refuted by one instance of (F&∼G).

Two questions arise: (1) Can *ceteris paribus* generalizations qualify as genuine laws? That is, can genuine laws have exceptions?[20] And (2) Even if there are genuine *ceteris paribus* laws, can these laws explain anything? Let us address these questions in turn.

The two main worries concerning the existence of genuine *ceteris paribus* laws are these: (1) We do not have an informative account of the truth conditions for *ceteris paribus* law statements, and consequently, some have argued that a *ceteris paribus* law—e.g., '*ceteris paribus*, all Fs are Gs'—asserts nothing more than the vacuous tautology 'All Fs are Gs, except when they are not.'[21] (2) *Ceteris paribus* laws make no predictions. The law '*ceteris paribus*, all Fs are Gs', combined with the information that x is F (and together with any combination of auxiliary hypotheses), does not entail that x is G (or even that with probably p, x is G).

Several philosophers proposed *sufficient* condition for the non-vacuity of *ceteris paribus* laws. For example, Pietroski and Rey suggest that '*ceteris paribus*, all Fs are Gs' is non-vacuous if (roughly) whenever x is F, but x is not G, there is an independently explanatory interfering factor at work; that is, there is a factor H that explains why x is not G, and H also explains something other than the fact that x is not G.[22]

This proposal is not without difficulties. Several philosophers have argued that it is too permissive—that is, too many statements qualify as *ceteris paribus* laws on this account.[23] Yet even if it is too permissive, it nevertheless shows that *ceteris paribus* statements are not vacuous—not *any* general statement qualifies as a *ceteris paribus* law.[24] Moreover, even if this proposal cannot be refined and improved on, the problem of the absence of truth

conditions for *ceteris paribus* law-statements might not be devastating. As Earman, Roberts, and Smith explain:

> Perhaps it is unreasonable to demand truth conditions for CP law-statements. This could be because the concept of a CP law is a primitive concept, which is meaningful even though it cannot be defined in more basic terms. Or it could be because an assertability semantics or conceptual-role semantics, rather than a truthconditional semantics, is appropriate for CP law-statements. Furthermore, one might well deny that it is necessary to have an acceptable philosophical account of the semantics for a given type of statement before granting that that type of statement plays an important role in science. And it is hard to deny that there are examples of statements qualified by CP clauses that seem to be perfectly meaningful.[25] (293)

The second worry—that *ceteris paribus* laws make no predictions—is, according to Earman, Roberts, and Smith, conclusive. Since *ceteris paribus* laws make no predictions, they are untestable; and since they are untestable, they cannot partake in scientific theorizing.

However, one could deny that *ceteris paribus* laws make no predictions. For instance, the law '*ceteris paribus*, all *F*s are *G*s' predicts that if x is F, and *cetera* are *paria*, then x is G. The problem is that we cannot specify the conditions under which *cetera* are *paria*, or in other words, that we cannot provide informative truth conditions for the statement '*cetera* are *paria*'.[26] But this problem doesn't seem any different from the first—that we cannot provide truth conditions for *ceteris paribus* statements. So if the first problem is surmountable—that is, if we are willing to accept the idea that *ceteris paribus* statements are meaningful even though we do not have an acceptable philosophical account of the semantics for these types of statements—then so is the second.

Furthermore, why should we think that predictions ought to be deductive? Certainly we cannot *deductively* predict that a particular F is G from the law '*ceteris paribus*, all *F*s are *G*s'; that is, we cannot predict this with certainty. But we make non-deductive predictions all the time: we predict the weather; we predict the outcome of elections and sporting events; we make predictions about the stock market and the economy, and so forth. In all these cases our predictions are not deductive, and the claim that our predictions might be false doesn't undermine their status as genuine predictions, nor does it prevent us from evaluating them as a good/bad or better/worse predictions. Our grounds for making such predictions, as well as our justification for these predictions may well rest on various *ceteris paribus* generalizations. This observation indicates that the claim that all predictions must be deductive—that is, that predictions must rely on strict laws, and must guarantee the occurrence of the event predicted—is not a constraint issued by the nature of the concept of prediction.[27]

Finally, even if Earman, Roberts, and Smith are correct in saying that *ceteris paribus* laws are inadmissible entities for scientific theorizing because such laws make no predictions and as a result they are untestable, we may still think that *ceteris paribus* laws are admissible in ethics. Ethical "laws"—strict generalizations as well as *ceteris paribus* generalizations—are not "testable" in any straightforward way. So if our only reason to object to *ceteris paribus* laws in the sciences is that unlike strict laws, *ceteris paribus* laws are untestable, then either we must object to all "laws" in ethics, or we may as well allow *ceteris paribus* moral laws in our ethical theorizing as well. In other words, considerations of testability do not differentiate between strict laws and *ceteris paribus* laws in ethics.

It is worth mentioning here one account of *ceteris paribus* laws due to Peter Lipton (1999).[28] According to Lipton *ceteris paribus* laws are genuine laws. However these laws need not identify exceptionless generalizations. Instead *ceteris paribus* laws "draw our attention to the stable dispositions and forces that underlie the flux of behaviour." (163) For example, "to say that glass breaks when dropped, *ceteris paribus*, is to say that glass is fragile and that this feature is not readily lost." (163) The crucial point is that *ceteris paribus* laws "refer to stable dispositions that may be widely present even if only rarely directly manifested." (163–4)

According to Lipton, dispositions can help us to make sense of *ceteris paribus* laws because, unlike properties which an object either has or lacks, dispositions are subject to a tripartite distinction: "displaying, present-but-not-displaying, or absent." (163) Roughly, Lipton's proposal is that *ceteris paribus* laws are true if they truly attribute a disposition to a kind. Nevertheless, they can have exceptions because a thing could fail to manifest a disposition that it has. So, for example, '*ceteris paribus* matches light when struck', attributes the disposition to light when struck to individuals of the kind 'match'. In an oxygen free environment, for example, a match would not light when struck even though it has the disposition to light when struck. So the *ceteris paribus* law is true, even though there are cases in which the disposition will not be exemplified. In contrast, '*ceteris paribus*, toothpicks light when struck' is false because toothpicks do not have the disposition to light when struck even if there were some situations in which toothpicks would light if struck.

The dispositional approach to *ceteris paribus* laws solves the vacuity problem for *ceteris paribus* law-statements and it provides a way to distinguish between the semantic problem and the predictive problem discussed above:

> We don't know when all things are equal, but the whole point of the dispositional view is in a sense that we do not need to know, since the disposition is present regardless. Of course some idea of when all things are equal (or equal enough) might be essential to applying the law to predict the manifestation of

the underlying disposition, but the basic dispositional attribution seems safe. (166)

If, as seems plausible, there are acceptable ways to test attributions of dispositions to kinds, then *ceteris paribus* law-statements may well be admissible in scientific theorizing.[29]

Now let's suppose that there are genuine *ceteris paribus* laws. Can such laws explain anything? For example, can we explain the fact that (3) *a* is *G*, by noting that (1) *a* is *F*, and that (2) '*ceteris paribus*, all *F*s are *G*s'? Obviously, we cannot deduce (3) from (1) and (2). However, I have argued that the deductive model of explanation is unmotivated, and indeed, I have claimed that once we allow for statistical explanation, we have already given up on a purely deductive model of explanation anyway. Once we give up on a purely deductive model of explanation we can see that (deductive) prediction and explanation may come apart. So although we cannot deductively predict (3) from (1) and (2), we may still be able to *explain* (3) in terms of (1) and (2). One reason why (deductive) prediction and explanation can come apart is, as Scriven observes, that "we have more *data* for explaining than we did for predicting." (1959b:469)[30]

To illustrate this point, let us consider one of Hempel's examples:

> If a particular revolution is explained by reference to the growing discontent, on the part of a large part of the population, with certain prevailing conditions, it is clear that a general regularity is assumed in this explanation, but we are hardly in a position to state just what extent and what specific form the discontent has to assume, and what the environmental conditions have to be, to bring about a revolution. (1942:41)

Recall that according to Hempel, since we are not in a position to identify exceptionless generalizations that connect population discontent and the occurrence of revolutions, an explanation of a particular revolution in those terms would be, at best, an explanation sketch. And as we have seen in the previous section, it is not clear how an explanation sketch (for Hempel) is at all explanatory.

Alternatively, suppose we could find and formulate a *ceteris paribus* law relating population discontent and the occurrences of revolutions; perhaps we could formulate a *ceteris paribus* law that looked something like this:

> (CPR) *Ceteris paribus*, if a large portion of the population of a particular nation is discontent with its current regime, then a revolution occurs.[31]

We cannot use (CPR) to (deductively) predict the occurrence of a revolution in any particular nation with certainty.[32] Even if we knew that 80% of the population of nation *N* are discontent with their current regime, we do

not know whether 80% of the population qualifies as "a large portion," and, of course, we do not know whether *cetera* are *paria*. So it is impossible to (deductively) predict with certainty the occurrence of a revolution based on (CPR) and a set of statements of initial conditions. Nevertheless, suppose we know that a revolution occurred in nation N, and we now want to explain this occurrence. If we know that a large portion of the population of nation N were discontent, then this fact, together with (CPR) is at least a *candidate explanation*. And if we cannot find an alternative (plausible) explanation of the occurrence for the revolution, then we may well accept this candidate explanation as an adequate explanation of the revolution, even though its explanans does not logically imply the explanandum.[33]

V. Explanation without Laws

The claim that there are genuine *ceteris paribus* laws is highly contentious. Indeed, according to some theories of laws it is impossible for laws to have exceptions, and consequently, the notion of a 'defeasible law' or a '*ceteris paribus* law' is, on these theories, simply an incoherent notion.[34] Now if we were correct in assuming that special sciences like biology, psychology, economics, and history sometimes provide good explanations even when strict laws are unavailable, then those who deny that *ceteris paribus* law statements refer to genuine laws, must conclude that laws are not required for explanation—that is, that an explanation can be perfectly adequate without appealing to any genuine laws at all.[35] In this section I will briefly describe two models of explanation that do not rely on the availability of laws of any kind.

The first account is due to Michael Scriven (1959b, 1962). Scriven's insight is that we ought not to confuse an explanation with the justification of the explanation. Recall that for Hempel, (strict) laws are required for explanation because an explanation must *guarantee* the occurrence of the explanandum; if the explanation lacks a true general proposition that connects the explanans with the explanandum, then the occurrence of the explanans doesn't *uniquely imply* the occurrence of the explanandum. Scriven claims that Hempel's insistence on always including laws as part of the explanation is unwarranted—it conflates the explanation itself with our reasons for thinking that the explanation is a good explanation.

Scriven notes that an explanation could be defective or deficient in (at least) three different ways: it could be *inaccurate*, if the explanans is ill supported by the evidence; *inadequate*, if the explanans does not fully explain the explanandum; or *irrelevant*, if the explanation is of the wrong kind (e.g., causal explanation rather than psychological explanation). Corresponding to these three possible deficiencies, are three types of justifications for explanations: *Truth-justifying grounds* are the grounds for thinking that the explanation is accurate—i.e., our evidence for the truth of the explanans;

Role-justifying grounds are our grounds for thinking that our explanation is adequate (at least in the relevant context); *Type-justifying grounds* are our grounds for thinking that one type of explanation is required rather than another.

Scriven argues that just as the truth-justifying grounds and the type-justifying grounds need not be included as a part of an explanation, so do the role-justifying grounds. If, upon giving an explanation, we are asked why we think the explanans are true, we will mention the truth justifying grounds of the explanation—i.e., our evidence for the truth of the explanans—but these need not be a part of the explanation. Similarly, if, upon giving an explanation, we are asked why we think the explanans support the explanandum, we will mention the role justifying grounds of the explanation—which may include a general (strict) law that connects the explanans with the explanandum—but these, too, need not be a part of the explanation.

Moreover, Scriven contends that the role-justifying grounds *need not* involve strict laws at all. He illustrates this by presenting a case "where we can be sure beyond any reasonable doubt that we have a correct explanation" and yet, we cannot provide strict laws as role-justifiers.

> As you reach for the dictionary, your knee catches the edge of the table and thus turns over the ink-bottle, the contents of which proceed to run over the table's edge and ruin the carpet. If you are subsequently asked to explain how the carpet was damaged you have a complete explanation. You did it, by knocking over the ink. The certainty of this explanation is primeval. It has absolutely nothing to do with your knowledge of the relevant laws of physics; a cave-man could supply the same account and be quite as certain of it . . . its *certainty* has nothing to do with your ability to quote the laws . . . if you were asked to produce the role-justifying grounds for your explanation, what could you do? *You could not produce any true universal hypothesis* in which the antecedent was identifiably present (i.e., which avoids such terms as "knock hard enough"), and the consequent is the effect to be explained . . . The simple fact must be faced that certain evidence is adequate to guarantee certain explanations without the benefit of deduction from laws. (456)

Scriven suggests that instead of laws, we should appeal to *normic statements* as the role-justifying grounds for good explanations of particular events. Scriven elucidates the notion of a normic statement with a few examples. (N1) "Rhombi" means the same as "equilateral parallelograms";[36] (N2) The penalty for revoke, in bridge, is two tricks; (N3) Strict Orthodox Jews fast on the Day of Atonement; (N4) Other things being equal a greater number of troops is an advantage in battle; (N5) A rise in the tariff characteristically produces a decline in the value of imports. Statements like (N1)-(N5) are not analytic, and they are also not refutable by a few counter instances (e.g., a few erring students who use "Rhombi" and "equilateral parallelograms" in a non-interchangeable way, do not undermine (N1); An

Orthodox Jew who doesn't fast due to illness, doesn't undermine (N3) etc.) Yet more, these claims are not statistical claims. (N2) could be true even if most bridge players do not apply a two-trick penalty for revoke; and (N4) could be true even if in most battles ever fought the armies with the greater number of troops lost the battle. According to Scriven, "The normic statement says that *everything* falls into a certain category *except* those to which *certain special conditions* apply. And, although the normic statement itself does not explicitly list what count as exceptional conditions, it employs a vocabulary which reminds us of our knowledge of this, our trained judgment of exceptions." (1959b:466)

Moral statements like (N6) Lying is wrong making; and (N7) One ought to bring about the best consequences, could also be understood as normic statements. The fact that we cannot explicitly list the special conditions under which lying is not wrong making, for example, need not disqualify (N6) as the role-justifying grounds for a good explanation of the wrongness of a particular act of lying. And the fact that trained judgment is required in order to determine whether the fact that a particular act involves lying *explains* why this act is wrong, need not trouble us; since we do not have a satisfactory analysis of 'lying'—or any other interesting philosophical concept, for that matter—then even if (N6) were a strict law, we would still need to apply trained judgment in order to determine whether a particular act involves lying in the first place.

Since Scriven contends that the special sciences provide good explanations even though strict laws are, for the most part, unavailable, he concludes that normic statements are essential to the explanation of particular occurrences:

> Explanation of an individual occurrence must use normic role-justifying grounds because (1) there aren't any true universal hypotheses to speak of and (b) statistical statements are too weak—they abandon the hold on the individual case. The normic statement tells one what had to happen in *this* case, unless certain exceptional circumstances obtained; and the historical judgment is made (and open to verification) that these circumstances did not obtain. (467)

Another account of non-law-based explanations we should briefly mention is due to William Dray.[37] Contra Hempel and Oppenheim, Dray thinks that an explanation need not (always) demonstrate that the explanandum had to occur; sometimes an explanation need only to show that the explanandum *could* occur. In other words, in some contexts all we need to show is that the occurrence of the explanandum is *possible* even though it is not *necessary*.

To mark this distinction, Dray differentiates between explaining *why something happened*, and explaining *how it could have happened*. "In explaining why something happened," he writes, "we rebut the presumption that it *need not* have happened, by showing that, in the light of certain considerations (facts and laws), it *had* to happen." (20) In contrast, "in explaining how

something could have happened, we rebut the presumption that it *could not* have happened, by showing that, in the light of certain further facts, there is after all no good reason for supposing that it could not have happened." (20) Dray contends that these two kinds of explanations are distinct because they provide answers to different questions, and there is no reason to think that one kind of explanation is more fundamental than the other.

In order to show that something could have happened, we need not find premises from which its occurrence logically follows. Instead, all we need to do is to tell a plausible story about how it could have happened. And according to Dray, historical explanations are often of this kind. So, he concludes,

> an historical explanation may thus amount to *telling the story of what actually happened*, and telling it in such a way that the various transitions . . . raise no eyebrows. The story is told in such a way that presumptions of the form, 'But surely that couldn't have happened!', are rebutted in advance. Answers to likely objections are *built into* the narrative, which may thus have explanatory force (27)

Dray does not deny that on occasion we may want more than the story of the event in question. Nevertheless, the telling of any particular story about what actually happened is meant to answer the question how this occurrence could have happened. If we ask a different question—e.g., 'Why this occurrence and not a different occurrence?' or, 'Why this story and not a different story?'—we should expect a different answer. But this does not undermine the adequacy of the proposed explanation as an answer to the question for which it was presented. It is certainly no surprise that different questions demand different answers, and one ought not to expect that an explanation offered as an answer to one question would also answer *all* possible follow-up questions, since if this were required, no explanation would have been possible at all.

Following Dray we may distinguish between explaining *why* an act has a certain normative status, and explaining *how it is possible* that an action has a certain normative status. In explaining why an act has a certain normative status we "rebut the presumption" – as Dray puts it – that this action *need not* have had this normative stats. In contrast, in explaining how it is possible that an action has a certain normative status we rebut the presumption that it *could not* have had this normative status. To paraphrase Dray, a moral explanation may amount to telling the story of the action in a way that raises no eyebrows; in a way that presumptions of the form, 'but surely this act *cannot* have this normative status' are rebutted in advance.

In this section I have presented two accounts of explanation that are not based on laws, strict or *ceteris paribus*.[38] For our purposes here, we need not decide whether explanations of particular occurrences ought to be grounded

in *normic statements* or whether explanations are (sometimes) "stories of actions." The important point for us is that there are alternatives to the deductive model of explanations. And since the deductive model of explanation is, at best, incomplete, there is no reason to think that explanation in ethics must conform to the deductive model. Indeed, given the kind of phenomena that ethics is about, it seems reasonable to expect that the kind of explanations we will find in ethics would be more similar to explanations in the special science than to those we find in the physical sciences.

VI. Explanation as a Pragmatic Phenomenon

One of the hallmarks of Hempel's theory of explanation is that Hempel attempts to provide a *syntactical* condition for the adequacy of explanations; an explanation is adequate only if the explanandum syntactically follows from the explanans. However, several philosophers, and most notably Scriven, have argued that "Explanation is not a syntactical but a pragmatic notion," (1959b:452) and consequently, any syntactical constraints are bound to be too restrictive. According to Scriven, the only thing we can say about explanation without artificially limiting the concept is that "explanations must produce understanding, and not simply knowledge." (451) Scriven insists that tying explanation to understanding in this way does not imply that the standards for the adequacy of explanations are purely subjective, because "there are objective tests for understanding just as for knowing or inferring. They happen not to be syntactical tests as are (supposedly) those for deducing." (452) Unfortunately, though, Scriven doesn't have a lot to say about the notion of understanding.

   Hempel, in his 1965 'Aspects of Scientific Explanation', admits that there is a pragmatic sense of 'explanation': "To explain something to a person is to make it plain and intelligible to him, to make him understand it." (425) However, in this pragmatic sense, the very same account could constitute an explanation for one person and not for another. So this pragmatic sense of explanation affords a relativised notion of explanation: *E* is an explanation *for* a particular individual; there are no explanations *simpliciter*. Hempel acknowledges that the pragmatic aspects of explanation are interesting and important. Nevertheless, he contends that we must try to find an objective account of scientific explanation, which conforms to the objective (i.e., non agent relative) standards of scientific research. The covering law model of explanation is meant to satisfy this demand for objectivity. Moreover, in response to Scriven's critique of his deductive model, Hempel declares:

   To call attention to the important pragmatic facets of explanation and to indicate the diverse procedures that may be appropriate in different cases to dispel the perplexity reflected in someone's quest for an explanation is not to show that a nonpragmatic model of scientific explanation must be hopelessly

inadequate . . . It is therefore beside the point to complain that the covering-law models do not closely match the form in which working scientists actually present their explanations. (427–8)

Hempel is clearly correct in saying that merely calling attention to pragmatic facets of explanation does not *show* that all nonpragmatic models of explanation *must* be inadequate. But this response seems to misconstrue Scriven's objection. Scriven doesn't merely point out that the covering law model is not exemplified in scientific discourse—which, as Hempel observes, would have been besides the point—but rather, Scriven claims that many perfectly adequate explanations *cannot* be restated as deductive arguments in which the (sentence describing the) explanandum follows from the (sentences describing the) explanans. So Hempel's response to Scriven is misguided.

Moreover, Hempel seems to conflate explanation as a pragmatic notion with explanation as a subjective notion. To say that explanation is a pragmatic notion is to say that what qualifies as an adequate explanation is context sensitive, but it need not be agent relative in any objectionable way. And as Salmon (1989) observes, developments in the study of formal pragmatics in the 70's made possible the development of a pragmatic theory of explanation. So one final approach to explanation we ought to consider here is a theory of explanation that takes seriously the pragmatic nature of explanation, and Bas van Fraassen (1980) developed such a theory.

Van Fraassen summarizes his view as follows:

[An explanation is] a three-term relation, between theory, fact, and context. No wonder that no single relation between theory and fact ever managed to fit more than a few examples! Being an explanation is essentially relative, for an explanation is an *answer* . . . Since an explanation is an answer, it is evaluated vis-à-vis a question, which is a request for information. But exactly what is requested by means of the question 'Why is it the case that *P*?,' differs from context to context. (156)

An explanation, according to van Fraassen is an answer to a why-question.[39] Van Fraassen identifies why-questions with an ordered triple <Pk,X,R>, where Pk is the *topic* of the question (or the explanandum), X is the *contrast class*, and R is the *relevance relation*. It is important to realize that the same interrogative sentence can express different questions on difference occasions in which it is uttered. For example, consider the question: "Why is act *A* morally wrong?" This sentence may express (at least) two different questions: (1) "Why is act *A* (rather than act *B*) morally wrong?" or (2) "Why is act *A* morally wrong (rather than morally right)?" The topic of the question in both cases is the same—i.e., that act *A* is morally wrong—but the relevant contrast class is different: in the former question the contrast class includes: (P1) 'Act *A* is morally wrong'; (P2) 'Act *B* is morally wrong';

etc.; whereas the contrast class of the latter question includes: (P1) 'Act *A* is morally wrong'; (P2) 'Act *A* is morally right'.

A *direct answer* to a why-question will take the form: Pk in contrast to the rest of X because *A*, where *A* is a proposition that bears relation R to the couple <Pk, X>. And an explanation, according to van Fraassen, is a *direct answer* to a why-question. We evaluate explanations in (at least) three ways: (i) how likely is this explanation to be true (given our background knowledge); (ii) to what extent does the explanation favor Pk, rather than other members of the contrast class; (iii) how this explanation compares with other possible explanations.

For example, suppose we want to explain why act *A* is morally wrong (rather than morally right). The topic, or the explanandum, is that act *A* is wrong. The contrast class is {*A* is morally wrong, *A* is morally right}. A possible answer to the question is that *A* is wrong (rather than right) because *A* involves the breaking of a promise. The quality of this explanation depends on considerations like the following: Does *A* in fact involve the breaking of a promise? To what extent does the fact that *A* involves the breaking of a promise support the claim that *A* is wrong rather than right? How does this explanation compare to other possible explanations (e.g., "*A* is wrong (rather than right) because *A* involves hurting an innocent by stander") etc.

Note that an adequate explanation, on this model, need not include laws at all. Furthermore, an explanation need not show that the explanandum had to occur; instead, it only has to show that the explanandum is more likely than the contextually salient alternatives in the contrast class, given (the contextually salient features of) our background knowledge. So, for example, the fact that a particular action involves the breaking of a promise might be a perfectly good explanation of its wrongness on one occasion, even though on a different occasion the fact that an action involves the breaking of a promise may be irrelevant to the explanation of its wrongness.

VII. Explanation in Ethics

In the previous sections I have shown that we have good reasons to think that adequate explanations need not appeal to exceptionless principles. I have argued that the most influential account of explanation according to which exceptionless generalizations are essential to proper explanation simply asserts this claim but does not argue for it. Moreover, since the special sciences sometimes provide adequate explanations even when exceptionless generalization are not available, then even if the deductive model were a successful account of explanation in the physical sciences, we would have to identify another non-deductive model of explanation to account for explanation in other areas. Finally, I have shown that other accounts of explanation are readily available. In particular I've discussed explanations that are based on the availability of *ceteris paribus* laws, and explanations that do not require

laws at all. I conclude that a survey of the literature on scientific explanation not only does not vindicate the generalist presumption that explanation must appeal to exceptionless principles, but rather it shows that this presumption is widely regarded as untenable. Indeed, this survey of the literature on explanation demonstrates that we are used to, and comfortable with, explanations that are not grounded in exceptionless generalizations in (almost) all areas of inquiry.

My discussion in the previous sections focused on accounts of scientific explanation, and clearly there are many differences between empirical sciences and ethics. So in order to employ any one of the models of explanation I presented in the previous sections in ethics, some modifications will be needed. Nevertheless, it is not hard to see how such changes can be made. Explanations based on *ceteris paribus* laws, or explanations grounded in *normic sentences*, for instance, as well as explanations relative to an implicit contrast class, could quite effortlessly be "transferred" to ethics.

Elsewhere, I distinguished between two types of generalist approaches: principle monism and principle pluralism.[40] Monists are those who claim that there is only one intrinsically morally relevant property—call it P—and that every action that exemplifies P is morally right. Pluralists hold that there are several intrinsically morally relevant properties—call these properties $P1 \ldots Pn$—and that for each intrinsically morally relevant property, Pi, there will be a presumptive, or *pro tanto*, principle: for any action, A, if A exemplifies Pi then A is presumptively morally right (or wrong). I have argued that both monists and pluralists are generalists because they both believe that an explanation of the rightness of an action is inadequate unless it is grounded in an exceptionless moral principle—strict or *pro tanto*.

We can now see that only monism is compatible with a deductive model of explanation. For monists the explanation of the rightness of A is that A exemplifies P, and that every action that exemplifies P is morally right; the explanandum logically follows form the explanans. For pluralists, in contrast, an explanation of the rightness of A is not deductive, because even if A exemplifies Pi, and every action that exemplifies Pi is *presumptively* morally right, it does not follow that A is morally right (in this case), but only that A is *presumptively* morally right. Ross (1930), for example, was well aware of this difficulty. "Our judgements about our particular duties," he explains,

are not logical conclusions from self-evident premises. The only possible premises would be the general principles stating their *prima facie* rightness or wrongness *qua* having the different characteristics they do have; and even if we could (as we cannot) apprehend the extent to which an act will tend on the one hand, for example, to bring about advantages for our benefactors, and on the other hand to bring about disadvantages for fellow men who are not our benefactors, there is no principle by which we can draw the conclusion that it is on the whole right or on the whole wrong. In this respect the judgement as

to the rightness of a particular act is just like the judgement as to the beauty of a particular natural object or work of art. A poem is, for instance, in respect of certain qualities beautiful and in respect of certain others not beautiful; and our judgement as to the degree of beauty it possesses on the whole is never reached by logical reasoning from the apprehension of its particular beauties or particular defects. Both in this and in the moral case we have more or less probable opinions which are not logically justified conclusions from the general principles that are recognized as self-evident. (31)

Pluralists, like particularists, must endorse a non-deductive model of explanation. But once we have given up on a deductive model of explanation, it is not clear what extra explanatory value is gained from the commitment to the claim that *every* action that exemplifies *Pi* is presumptively morally wrong, as opposed to the claim that *Pi* is *typically* wrong-making.

Ross believed that the fact that a fulfillment of a promise is *always* right-making, for instance, is self evident.

What comes first in time is the apprehension of the self-evident *prima facie* rightness of an individual act of a particular type. From this we come by reflection to apprehend the self-evident general principle of *prima facie* duty. (33)

For Ross, then, the commitment to the existence of exceptionless presumptive principles is not based on their role in explaining moral phenomena, but rather it is due simply to their self-evidence. However, it is not clear why Ross thinks that these principles are self-evident. Presumably, Ross thinks that we observe a few actions that involve promise keeping, and we notice that in those cases promise keeping is right-making. By reflecting on these cases we can see, according to Ross, that promise keeping is always morally relevant. But it is not clear how one could conclude from a particular case, or a set of cases, that promise keeping is *always* morally relevant. For example, suppose that Jack promises Jill that he would plagiarize his final paper for his philosophy course. Now suppose that he does. It sounds comical (to my ear) to say that although his act of plagiarizing is wrong, it has at least one thing going for it—it is a keeping of a promise. I don't deny that one could insist that this is so, but it certainly doesn't seem *self evident* that in keeping his promise to plagiarize, Jack's plagiarism is made any better.[41] And once we give up on a deductive model of explanation—as pluralists must—the commitment to the claim that promise keeping is *always* morally relevant is not only unmotivated but also unnecessary.

Elsewhere I argued that particularist and pluralist theories have a certain advantage over monist theories; particularist and pluralist theories, I claimed, can better explain the availability of good moral advice than monist theories.[42] If I am right about this—that is, if we have reason to prefer particularism and pluralism to monism—then we now see that we also have

reason to prefer particularism to pluralism, since pluralists' commitment to the availability of strict presumptive principles has theoretical costs, but it doesn't seem to have any theoretical benefits.

VIII. Conclusion

The claim that moral explanation must appeal to exceptionless principles has rarely been argued for.[43] Nevertheless, many philosophers find the particularist research program objectionable because they believe that giving up on the search for exceptionless moral principles is tantamount to giving up on moral theorizing. I hope to have shown that this belief is mere dogma—it is based on an undefended, and indeed, an indefensible notion of explanation. A careful study of the literature on explanation reveals that a deductive approach to explanation is unmotivated, and moreover, that it is widely regarded as an inadequate account of explanation in the special sciences, and arguably in the physical sciences as well.

I have not recommended any particular non-deductive model of explanation. I believe that any one of the non-deductive models discussed in sections III-VI is compatible with particularism—once the proper adjustments are made to accommodate moral explanation rather than scientific explanation. Indeed, different particularist theories may endorse and defend different models of explanation, and the structure of each individual particularist theory may well depend on the specific details of the non-deductive theory of explanation it is committed to. Some particularist theories may try to identify *ceteris paribus* moral generalizations or moral *normic* sentences, other theories may look for moral dispositions, and yet others may focus on the pragmatic nature of moral explanations.

Each of the theories of explanation discussed in this paper is not without difficulties. Explanation, like all other philosophically interesting concepts, is a difficult concept to analyze, and the plurality of theories of explanation may lead us to conclude with Roth, that "there is no good reason to believe that there is just one correct explication of the notion of explanation." (1988:3) Be that as it may, the plurality of theories of explanation, the difficulties they all face, and the fact that there is no consensus about which theory of explanation is correct, should convince us that one cannot dismiss a competing moral theory simply by pointing out that there are difficulties for the account of explanation this theory is committed to.

One might still insist that since there are known difficulties for all the accounts of explanation currently available, then we have reason to look for exceptionless moral principles. One might argue that such principles, if found, would provide a *simpler* explanation of moral phenomena than any one of the alternatives discussed above. But first, the simplicity of the explanation will depend, of course, on whether the exceptionless principles involved are actually simple. If the only exceptionless principles we find are extremely

complex, then an explanation in which they are employed may well be no simpler than its competitors.

 Second, even though simplicity may count in favor of a theory, it is not the only virtue a theory must exemplify. In our efforts to eliminate counterexamples, we may inadvertently rob our principles of their explanatory power, for example, by restricting the range of situations to which they apply, or as a result of *ad hoc* modifications to circumvent exceptions.

 Finally, we must not forget that moral phenomena are undeniably complex, and as Hayek (1967) observes "a simple theory of phenomena which are in their nature complex . . . is probably merely of necessity false—at least without a specified *ceteris paribus* assumption, after the full statement of which the theory would no longer be simple." (28) Einstein is remarked upon as saying that everything should be as simple as possible but no simpler. And this is as true in ethics as it is in the sciences.[44]

Notes

 [1] Or at least, all principles that have been proposed thus far are contentious.

 [2] See Leibowitz (2009a).

 [3] Probably the most elaborate non-deductive model of moral explanation is due to Lance & Little (2004, 2006a, 2006b, 2007). But see also Dancy (1993, 2004), Little (2000), Väyrynen (2006, 2009), and McKeever & Ridge (2006).

 [4] Hempel and Oppenheim (1948). For a discussion of the importance and influence of Hempel and Oppenheim's essay, see, for example, Salmon (1989) and Woodward (2003a, 2003b).

 [5] See Ladd (1952) fn. 1.

 [6] P. 499. Ladd borrows the phrase "potential predictive force" from Hempel and Oppenheim. See Hempel and Oppenheim (1948) p. 138.

 [7] One of the "statements of general laws" that Hempel and Oppenheim claim their proposed explanation appeals to is "a statement about the small thermic conductivity of glass." Their explanation does mention that the "coefficient of expansion [of mercury] is considerably larger than that of glass," but as stated, this is a statement of fact and not a statement of a general law.

 [8] The second example Hempel and Oppenheim present is no more helpful than the first:

> To an observer in a row boat, that part of an oar which is under water appears to be bent upwards. The phenomenon is explained by means of general laws—mainly the law of refraction and the law that water is an optically denser medium than air-and by reference to certain antecedent conditions—especially the facts that part of the oar is in the water, part in the air, and that the oar is practically a straight piece of wood.—Thus, here again, the question *"Why* does the phenomenon happen?" is construed as meaning "according to what general laws, and by virtue of what antecedent conditions does the phenomenon occur?" (136)

In this case Hempel and Oppenheim do not present the explanation of the phenomenon in question. Instead they simply assert "the phenomenon is explained by means of general laws . . . and by reference to certain antecedent conditions." Again, the "thus" in the final sentence is

misleading. Surely Hempel and Oppenheim construed the question "*Why* does the phenomenon happen?" as meaning "according to what general laws, and by virtue of what antecedent conditions does the phenomenon occur?" but they offered no argument as to why it should be so construed. Moreover, their use of passive voice here is also ambiguous. The phrase "the question is construed as" could be read as a descriptive claim—emphasizing the point that Hempel and Oppenheim in fact construed it in this way—or as a normative claim—the question *ought to be* construed as they propose. In either case we have no argument for the claim that the question should be construed as Hempel and Oppenheim construe it.

[9] For example, lying is not wrong (or even wrong-making) when playing a game in which lying is the point of the game (e.g., *Diplomacy* or *Contraband*). Other examples of lies that are, arguably, not wrong (or wrong-making): lying to a Nazi concentration camp guard; lying to a dying patient (e.g., "everything is going to be all right"); Lying to a person about their appearance (e.g., just before going on stage to give an important lecture, your spouse asks you how she looks; it is probably not wrong to tell her that she looks great even if she, in fact, doesn't—i.e., even if she looks nervous or pale).

[10] For example, the "organ harvest" scenario: it is wrong to kill an innocent passer-by (without her consent) in order to harvest her organs and to transplant them into five other patients who would otherwise die.

[11] For a similar criticism of Hempel and Oppenheim see Scriven (1962).

[12] See Scriven (1962)—esp. section 4.2—for a critique of Hempel and Oppenheim's notion of "complete explanation."

[13] See, for example, Dray (1954, 1957) and Scriven (1959a, 1959b, 1962).

[14] For a discussion of these issues see, for example, Salmon (1989).

[15] There are now well known counterexamples to Hempel and Oppenheim's account, which I do not discuss here. For a list of these counterexamples see, for example, Salmon (1989) and Woodward (2003b).

[16] This is not a sufficient condition for lawhood, but only a necessary condition. We need to distinguish between *laws* and *accidental generalizations* that can be expressed as true universal conditionals.

[17] For more on this debate see, for example, Cartwright (1983. 1989), Pietroski and Rey (1995), and Earman, Roberts, and Smith (2002).

[18] See, for example, Earman and Roberts (1999).

[19] See, for example, Fodor (1991), Pietroski and Rey (1995), Woodward (2002), and Earman, Roberts, and Smith (2002).

[20] For a recent defense of the view that laws can have exceptions see Schrenk (2007).

[21] See, for example, Schiffer (1991), Earman, Roberts, and Smith (2002), and Woodward (2002).

[22] See Pietroski and Rey (1995). For somewhat similar proposals see Fodor (1991), and Silverberg (1996). For a different account of the semantics of *ceteris paribus* generalizations see Lange (2000, 2002).

[23] See, for example, Woodward (2002) and Eearman, Roberts, and Smith (2002). Earman, Roberts, and Smith write: "Many substances that are safe for human consumption are white; for every substance that is white and is not safe for human consumption, there presumably exists some explanation of its dangerousness (e.g., in terms of its chemical structure and the way it interacts with the human nervous system); these explanations are not ad hoc, but can be supported by a variety of kinds of evidence; but none of this constitutes evidence for the hypothesis that it is a law that CP, white substances are safe for human consumption." (294) Similarly, Woodward claims that Fodor's account and Pietroski and Rey's account are "far too permissive. On both proposals, the generalization "All charged objects accelerate at 10 m/s^2" qualifies a *ceteris paribus* law." (310).

[24] Schurz (2001) criticizes Pietroski and Rey's account and he proposes an alternative account of *ceteris paribus* laws. Nevertheless, he admits that on Pietroski and Rey's account *ceteris paribus* laws are not vacuous, but only *almost vacuous*.

[25] Silverberg (1996) observes that the consequences of denying that *ceteris paribus* clauses are meaningful are unacceptable: "*ceteris paribus* conditions are unexceptional instances of a very common, and needed, phenomenon in our concepts and assertions, and hence [the] claim that cp conditions are semantically objectionable is a suggestion of unacceptably destructive import." (211) This is because most conditionals we assert are defeasible.

[26] Lange (2002) contends that judgment is required in the application of strict laws in specific cases in much the same way that it is required for the application of *ceteris paribus* laws. Even if it were possible to replace the '*ceteris paribus*' clause with a fully explicit list of conditions, the application of the "fully explicit" law "derives its content . . . by virtue of our implicit background understanding of what would count as compelling reasons for (or against) the correctness of applying it to a given case." (409) Once we realize this, we see that there is no special problem regarding truth conditions for, or predictions with, *ceteris paribus* statements. As Lange explains, the content of the "law of definite proportion" stated as a *ceteris paribus* law—i.e., Any chemical compound consists of elements in unvarying proportions by mass, *ceteris paribus*—is no more vague than a statement of this law without a *ceteris paribus* quantifier (if such a statement were possible)—e.g., Any chemical compound consists of elements in unvarying proportions by mass unless the compound is a network solid or a polymer. The content of 'network solid' in the second formulation is no less vague than the content of the *ceteris paribus* clause in the first. This, according to Lange, shows that "law need not be associated straightforwardly with a regularity. It may be associated only with an inference rule that is 'reliable' – i.e., that leads to conclusions close enough to the truth for the intended purposes." (411).

[27] I am grateful to Gary Matthews for calling my attention to this fact.

[28] This is not the only available account of *ceteris paribus* laws. One alternative account, due to Marc Lange, is based on a pragmatist account of lawhood. Lange argues that in order to see that *ceteris paribus* generalization are genuine laws, we should identify the distinctive role laws play in scientific theorizing, and recognize that *ceteris paribus* generalizations play the same role. See Lange (2000, 2003). For an application of this model to explanation in ethics see Lance and Little (2007). Silverberg (1996) makes a similar point regarding *ceteris paribus* generalizations: "*Ceteris paribus* laws are laws which, if the qualifying condition expressed in their *ceteris paribus* clauses were removed, could have counterexamples, and hence would require the qualification of their universality that *ceteris paribus* clauses express. Despite this need for qualification, the qualified principles are laws, since they retain considerable generality or scope, and possess considerable predictive and/or explanatory value." (201).

[29] For more on *dispositionalism*—the view that dispositions, rather than laws are the fundamental units of explanation—see Cartwright (1989, 1983) and Mumford (1998). For an application of this view to ethics see Robinson (2006) (Note, however, that my understanding of the disagreement between particularists and generalists is very different from Robinson's).

[30] See Scriven (1959a) for an argument that shows that explanation and prediction can come apart based on a discussion of the explanatory power of evolutionary theory. See also MacIntyre (1981) Ch. 8.

[31] I do not contend that (CPR) is a genuine *ceteris paribus* law—indeed, as stated, it probably isn't. I only use (CPR) for illustrative purposes and for the sake of the example I will assume that it is a genuine *ceteris paribus* law.

[32] As noted above, we may predict that a revolution will occur in nation *N*, and we may justify our prediction by appealing to (CPR) without using (CPR) to *deduce* that a revolution will occur.

[33] This is a simplified version of a kind of explanation that Scriven (1959b) calls 'selection explanations'. "What we have is a range of formally possible explanations . . . and on the basis of the facts of the case, we *select* one of the antecedents as the explanation. It is the particular

fact, not the general proposition or the derivation, which provides the explanation in such cases ... The point of the explanation is to locate the *relevant* causal antecedent, not to prove that it is a possible one." (462).

³⁴ For example, Armstrong's view, according to which laws are grounded in identities between universals, seems to preclude the possibility of laws that have exceptions. See Lance and Little (2007).

³⁵ Schiffer (1991) writes: "When *I* read biology, I have a hard time finding anything that looks like a law-invoking explanation, and I think I know why. Suppose you just invented the spring-activated mousetrap and had to explain *how it worked*. You would explain that, when the device works, it's because the mouse nibbles at cheese placed on a release mechanism; the movement caused by the nibbling releases a bar attached to a stretched spring; etc. But you wouldn't mention any laws. Maybe if you went on in an explanatory chain long enough, you'd get to laws: but they'd be laws of physics, not laws of mousetrap theory. In the same way, much of biology is concerned to explain how various mechanisms work—think of the explanation of photosynthesis—and such explanations seem not to invoke any biological *laws*, strict or *ceteris paribus* ... since [cognitive psychology, too, is concerned with] explaining how mechanisms work, there's no obvious reason such explanations should *need* laws, strict or *ceteris paribus*." (16) Schiffer does not explicitly say whether he thinks that "complete" explanations in biology and cognitive psychology *must* mention the physical laws that ground the operation of the mechanisms they explain. His last remark, however—that there is no obvious reason such explanation should need laws—suggests that he believes that explanations are perfectly adequate without mention of any laws.

³⁶ Scriven explains that unlike the sentence "Rhombi are equilateral parallelograms," (N1) is not analytic because its denial is not self-contradictory.

³⁷ See Dray (1954, 1957). The citations in the text are from Dray (1954).

³⁸ The two non-law-based theories of explanation discussed in this section can easily be employed in order to explain moral phenomena. These two theories, however, are not the only non-law-based theories of explanation that have been proposed. Woodward (2002, 2003a), for example, developed a non-law-based theory of explanation according to which to explain something is to cite a feature that makes a difference to the occurrence of the explanandum. It is crucial for Woodward's account that we can identify that a feature is (causally) relevant to the occurrence of the explanandum without identifying the specific conditions under which it makes a difference. The way we do this, according to Woodward, is through randomized tests where we can justifiably assume that other relevant (or interfering) factors are (roughly) equally distributed between the test group and the control group. But randomized tests are not standard practice in moral theorizing, so some modifications, or at least clarifications, are in order if we are to adopt this model of explanation as an account of explanation in ethics.

³⁹ Van Fraassen, following Hempel and Oppenheim, identifies explanation as an answer to a why-question. But as Dray (1954, 1957, 1959), Scriven (1959b, 1962), and Salmon (1989) point out, not all answers to why-questions are explanations, and not all explanations are answers to why-questions. Yet although the details of van Fraassen's account are not quite right, his main insight—that whether a particular account qualifies an adequate explanation depends on the context in which the explanation is given—is still worth noting. For a critique of van Fraassen's account, see Kitcher and Salmon (1987) and Salmon (1989).

⁴⁰ See Leibowitz (2009b).

⁴¹ For additional critiques of Ross's self-evidence claim and the epistemological difficulties involved, see Dancy (1983).

⁴² See my (2009b).

⁴³ Ladd (1952) is a notable exception.

⁴⁴ In his paper 'The Tyranny of Principles' Stephen Toulmin reports on a quotation, attributed to H. L. Mencken, that hangs in the staff lounge at The Hastings Center: "For Every human problem, there is a solution that is simple, neat, and wrong." (1981:31).

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