while the bad man can only be interpreted as not employing judgments (or categories) at all but some general inflexible mode of conduct. It is in this sense that vice is an extreme. And the virtues and vices are discontinuous, since the differences between intermediate and its extremes are not here a matter of degree. But the vices do confirm the categorial analysis in that they become extremes in one or more of the practical categories.

For Aristotle, practical reason and judgment spring from and are conditioned by the agent's character. Virtue is not a matter of judgment, although judgment is a matter of virtue. Thus the mean, and the practical categories, do not provide rules for determining the virtues, although they are employed implicitly in that determination. They provide then general characteristics of what practical reason judges to be virtuous.[3] And the proper application of the mean as a principle both requires experience and depends on a virtuous character. Thus what appears to be a problem, how propriety within each of the categories is determined, does not become a problem for Aristotle. This itself must be a matter of practical judgment based on a virtuous character. And this reinforces our reading of the Nichomachean Ethics above.

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NOTES

1. Aristotle, Politics, 1287b 44ff; Nichomachean Ethics, 1132a 20ff are examples.

2. "But not every action nor every passion admits of a mean; for some have names that already imply badness." Aristotle, Nichomachean Ethics, 1107a 8-10.

3. This is consistent with and casts light on the passage cited on page .

THE S-PREMISE

S. Ron Oliver

It is the intention herein to explicate and deal with certain aspects of scientific explanation. In particular, this is to be done with critical reference to material presented by Richard Cole in Wisdom. In keeping with this secondary goal, and due to the natural limits of time and space it will not be possible to provide a complete, cohesive theory of knowledge, though such is usually fundamental to the development of a theory of scientific explanation. Effort will be made, however, to provide sufficient guidelines of the underlying theory as to render the theory of explanation intelligible.[1]

I. The Standard Model of Explanation

The particular feature with which we are concerned is Cole's analysis of explanation, of which the account of Alethea and her encounter with the watch is the prototype. In doing science we observe a certain (simple or complex) phenomenon. We are motivated through an element of curiosity (or whatever) to "explain" that phenomenon. Of course, there are some events which do not so motivate us. They are, in some sense, primitive. We accept them at face value (as they are presented to us) as not being in need of explanation. The business of doing explanation enters when we are confronted with phenomena which we do not take as primitive.

A study of such phenomena ensues which involves various and sundry observations and actions. The goal of this study is to obtain (discover) a set or network of elements which are themselves primitives, or combinations of primitives, and when taken as a related whole have the force of eliminating our perplexity about the event under scrutiny. That is, we proceed to provide a causal (to use the term loosely) pattern of primitive observations which, if properly related in a logical manner, explain the phenomenon which motivated our study. And the essence of this explanation is the elimination of curiosity or motivation to explain.

In general, the resultant explanation will refer to a rather restricted set of impressions (real-world phenomenon). At first we might only apply it to those specific events which we have observed during the construction of our explanation. We then may become more generous and apply our analysis to all events like those we have dealt with. Whatever the interpretation set of our explanation, the form of it might be represented thus:

(A) $A_1, A_2, \ldots, A_n \longrightarrow B,$

where B is the phenomenon we wish to explain, and the A_1 are the primitives which (at least for the present) we take as not being themselves in need of explanation, and as providing the explanation of B.

II. What!?! No Prediction?

The above model is a very simplistic one which might be given as a general description of any one of several theories of explanation. The claim here is that Cole's theory, if viewed with the proper degree of flexibility, is one such theory of explanation. At the least, the parts of Cole's account with which we are concerned are consistent with the model A.

The unique feature of Cole's theory is that model A, more than being the beginning of his analysis, is almost the entirity of it. Most theories of explanation go on from the limited application of A to universalize, in some relevant sense, that application to a broader spectrum of events B. The interpretation set of the model A is increased in an important, general way. In this way most theories of explanation include a predictive element. Having realized that all past B's (i.e., all B's we have experienced) have subjected themselves to the model at A we are compelled to claim that future B's will also be so subject to analysis.

Cole wishes specifically to eliminate this predictive element from his theory. He might give an account such as: whenever we encounter a phenomenon like B we claim that it must have been attended (in an explanatory way) by phenomena like $A_1, A_2, \ldots, A_n$. But we must invoke a very high standard of like. In fact, we should adopt the very highest standard of like. Our standard will be so high that, in principle it is impossible to encounter a B which is not attended by the A_1. For if we do we can only conclude that this most recent encounter of a B was only mistakenly taken to be a B. It was not sufficiently like the B's of our previous analysis to be properly understood as being explained by that analysis. In particular, future encounters of B do not qualify precisely because they are future. Our analysis was of past or present B. Future B's are not sufficiently like past or present B's in that they are future. Thus, Cole's theory of explanation, by it's very nature, is devoid of predictive value.

The above account may carry Cole's position to an extreme. But it is consistent with that position, in spirit, in that if the position does allow for an element of prediction it does so only in a very limited way.

III. True-Today-False-Tomorrow

In brief, then, Cole proceeds by taking explanatory theories out of the realm of meaningful universal statements. This last claim is intentionally harsh. It relies on the more fundamental

claim that meaningful theories of explanation, by definition, include an element of prediction which is much less restrictive than that of Cole's.

The motivation behind Cole's severe restriction of predictability is quite clear. It does not please him to suggest the possibility that an analysis which is so firm and believable, such as Alethea's explanation of the working of the watch, will, at a later date, turn out to have been false, or at least incomplete, and therefore unbelievable. It is absurd, for Cole, to say that Newtonian physics was wrong. It is more acceptable to say it was right in its day, and, as such, is still right.

According to certain theories of explanation, usually referred to as falsifiability theories, Newtonian physics was shown to be false by Einstein. And Alethea's theory may be shown to be false tomorrow. Indeed, at least one such theory--that of Karl Popper--maintains that the falsification of explanatory theories is the only proper business of science. Cole finds this sort of "refuting the obvious" to be undesirable. Cole's objection might be referred to as the true-today-false-tomorrow objection. It is to avoid this phenomenon that Cole eliminates the element of prediction from his theory of scientific explanation. Observe that in so doing he is concurring with Hume's high standard of logical necessity between cause and effect.

In the remainder of this essay it will be argued that (1) elimination of the element of predictability from theories of explanation is at least as undesirable as the true-today-false-tomorrow phenomenon, and (2) the undesirable elements of this latter phenomenon may be eliminable without the simultaneous elimination of the element of predictability. That is, the attempt will be made not precisely to eliminate the true-today-false-tomorrow phenomenon, but to render it less objectionable.

IV. The S-Premise

Both points (1) and (2) above will be the result of looking at the model of scientific explanation in a somewhat novel way. The theory presented will add to the logical analysis of explanatory theories an element uniquely different from any of the A_1 or B in the model given at A. This additional element is a premise which will be referred to as the S-premise. The analysis at A can be seen, in some sense, to be analytic. This is particularly clear if, like Cole, we do not universalize it in a non-trivial way. That is, if we restrict the interpretation set of model A sufficiently, its analyticity is granted. The S-premise will differ primarily in that, rather than participating in the analyticity, it will stand apart from and refer to the analytic parts of A. The claim of this essay is that all explanations (if they are complete and correct) will include, at least implicitly, the S-premise. In other words, the model of explanation given at A is to be rejected in favor of a more complete model of the form:

(B) $A_1, A_2, \ldots, A_n, S \longrightarrow B.$

But what is the premise S? At one point in Cole's in-class rendition of the Alethea and the watch example, he observed that when we have reached a complete explanation of a phenomenon we have a theory which is, in character, not subject to the true-today-false-tomorrow objection. This is so, that is, with one important provision: our theory is final and valid provided that we have been sufficiently clear and accurate in our perceptions and delineations of the elements (i.e., the A_1) of that explanation. Or, in another way, we all recognize that if our analysis is careless or confused in certain ways, and if this is later recognized, we would not insist that it was true (and therefore still is) before we were made aware of our error. In short, we are willing to stand by our explanations only if (in the relevant senses) we were not mistaken in giving them in the first place. If Alethea had given an account of the workings of the watch which did not include mention of the main-spring she would not under any circumstances be justified in maintaining that her first account was true when she realizes that the main-spring actually does play a role in the working of the watch. Such a first account of the watch would not be seen as satisfying the provision underscored above. The final account actually given by Alethea does meet that provision, however. The point of the provision is to allow for careless and perceptual error as being different from the sort of error that fails to predict properly in such theories as include an element of prediction.

The underscored provision is a very crucial one. In fact, it is much more significant and fundamental in the understanding of explanation than allowed by Cole in his "mentioning it in passing." He writes, also: "We want to understand! What is it we want when we want to understand?" (p. 103) The desire-cum-perplexity conveyed by the quoted passage is the essential driving force of all scientific explanation. We want to explain. We do so by reverting to primitives and relating them, in a logical way, to that which we are attempting to explain. But in so doing we want to be very sure we are quite clear about those primitives, their relationships, and those elements to which we interpret them as applying. Yet we are never (except in rather trivial matters) confident beyond question of our clarity. Thus we are naturally compelled to make such provisions as:

> (C) We have been sufficiently clear and accurate in our perceptions of the elements ($A_1, A_2, \ldots, A_n$), their relationships, and their interpretations in our explanatory analysis of the phenomenon B, haven't we?

(C) is one formulation of the S-premise. It may not be as precise as it could be. A more precise formulation is not important. What is important is that the principle, of which (C) is one formulation, is seen to be a crucial part of a completely delineated scientific explanation. An explanation is meaningless

without such a premise, for it encompasses the very spirit of explanation.

The purpose of scientific explanation is to provide an understanding of the phenomena which we encounter in our daily experiences. Such understanding amounts to the clear perception of primitive elements of that experience and their relationships to each other and to the phenomena we are attempting to understand.

V. Prediction

Given this model of explanation it is simply unacceptable to understand it as being severely limited in application. Hume was quite right to observe that a basic function of intellect is to continuously expand the set of events covered by a given explanation. Once we have seen that cases $B_1, \ldots, B_n$ of the phenomenon B have successfully submitted to a particular analysis such as that at A, we quite naturally proceed to ask (and answer) what other events may be so analyzed. One direction in which expansion of the interpretation set is quite natural is into the future. In this way prediction readily creeps into our process of explanation. That the mind (or intellect) proceeds in this way is not logically justifiable, as Hume pointed out. It simply is a fact of intellectual behavior. Thus we must conclude that a theory of explanation which does not provide for prediction is not acceptable. Such a theory does not accurately describe the manner in which the intellect can easily be observed to naturally proceed.

The ability to predict, if it should obtain, confirms our S-premise. And such confirmation, after all, is the goal of doing science in the first place. Whether or not one believes the S-premise is satisfiable it would seem strange to deny that scientific inquiry is designed to satisfy some such criterion. To eliminate the element of prediction from a theory of explanation is to ignore the S-premise. To ignore the S-premise is to miss the spirit of scientific explanation.

The purpose of an explanatory theory is to satisfy the S-premise. The S-premise cannot be satisfied (except in a trivial way) unless we may put our theory to the hard test of requiring that it be predictive. Understanding only the past is essentially uninteresting. We are always driven to, always want to understand the future; impossible though this may be.

VI. True-Today-True-Tomorrow; False-Tomorrow-False-Today

But what of the true-today-false-tomorrow phenomenon? Does it not present itself still? On our latest model of explanation is it not the case that a falsifying instance of B, although it may not directly negate any of the A_1, does negate the S-premise? And, as such, is not our explanation which was considered true yesterday thereby rendered, if not false, at least meaningless today?

Observe, first, that the model of explanation given at B is such that, in principle, if B is found to be falsified in some instance it is usually the case that we respond by assuming that S, and not necessarily any of the A_1, was the culprit. Thus the skeleton of our explanation still remains. And, if the scope of S is limited sufficiently, the truth of the theory still stands. It was merely our insistence on extending the scope of our theory to broader and broader worlds of phenomena which rendered the falsification. What was true yesterday is still true. But today we are considering a slightly different theory, and have found it to be not true.

This account is not entirely to do away with the true-today-false-tomorrow phenomenon. It is intended merely to provide such therapy as might render the phenomenon less objectionable.

VII. Appendix

In conclusion there are several points of interest which should be mentioned.

(1) Some might construe the S-premise as being, at least in part, a formulation of, and therefore an invocation of, the principle of sufficient reason. One should be clear to note in this connection that the theory herein presented makes no claims about the logical necessity, for doing any or all rational discourse, that the S-premise be invoked. The claim is merely an observational one that, in fact, when people do scientific explanation they invoke the S-premise. Whether or not this is done necessarily is, at this point, an open question.

(2) The S-premise may in fact be a candidate for classification as a synthetic-a priori premise: hence the lable S-premise. This too is as yet an open question. Note that the S-premise is quite different in character from the kinds of principles Kant thought might be synthetic-a priori. It would appear to be a more lively candidate, however, than those of Kant.

(3) If one is doing explanation in the realm of pure ideas and their relations (such as in mathematics) the S-premise may, in most cases, be said to be trivially satisfied. Hence, it is usually, and properly, ignored in those explanations.

(4) Some of the major features of the over-all theory of knowledge, of which the above theory is a consequence, are:

(A) The primary, if not the only, function of intellect is the observation and attribution of similarity, and the insistence on consistency.

(B) A secondary aspect of this faculty of intellect is the imagination (or image construction) of what would correspond (via similarity) to a given concept or impression.

That is, given an initial, "new", impression the mind immediately proceeds to devise what likely story it may, consistently involving that new impressiom with previous knowledge.

(C) As a particularly interesting feature of the imagination, the mind (consciously or unconsciously) focuses on the S-premsse, during the scientific endeavor, and naturally moves to construct (image) an account wherein that premise is not satisfied. The results of this process include, among other things, Kant's antinomies and the drive to falsify scientific theories.

(D) If, in the attempt to perform the function described in (C), above the intellect is persistently unsuccessful, we hold the theory as undeniably true.

(E) There is no logical or necessarily temporal order to the preceding steps. And certain psychological phenomena may strongly mold the manner and intensity according to which they occur. Thus step (D) may often be reached prematurely.

The above elements of a theory of knowledge admittedly are not clearly or completely formulated or developed. They are presented here only in the hope they may render the main body of this essay more intelligible.

(5) It is interesting to note that the S-premise as described above has some meaningful correlation to the concept of adequateness of ideas as conceived by Spinoza in his Ethics. That is, an alternate formualtion of (C) may be:

(C') All the statements and related ideas of A_1, A_2, . . ., A_n, and of B, are adequate ideas, aren't they?

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NOTES

[1] See Appendix, (4) for a sketchy outline of the most relevant aspects of the theory of knowledge which underlies the theory of scientific explanation being presented.