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Probability and Foundationalism

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PROBABILITY AND FOUNDATIONALISM

C.I. Lewis believed that a person is justified in believing a proposition only if the proposition is probable relative to its ground. Armed with the principle that 'nothing is probable unless something is certain' (henceforth, the nothing probable principle), Lewis concluded that no one is ever justified in believing any empirical proposition unless some empirical proposition is certain. As he thought that coherence theories of justification entail that even though we are justified in believing empirical propositions none is certain,[1] Lewis concluded that foundationalism is the only tenable theory of justification (knowledge).[2]

In the celebrated 1951 American Philosophical Association Symposium which has become known as the Lewis-Reichenbach Debate,[3] Reichenbach argued that the nothing probable principle is false, and thus that Lewis's argument is unsound. In recent papers[4] James Van Cleve and Mark Pastin suggest that Reichenbach's objection fails and that Lewis's argument in favor of foundationalism is sound. In what follows I will examine the nothing probable principle, Reichenbach's objection to it, Van Cleve's defense of Lewis, and Pastin's defense of Lewis. I intend to show that while both Van Cleve's and Pastin's suggestions fail to provide an adequate defense of Lewis's argument, there is a gambit which Lewis suggests which answers Reichenbach's objection. This gambit makes use of Lewis's phenomenalism, a view to which Reichenbach expresses no objection. It is noted that in the third chapter, Lewis's phenomenalism is rejected, and thus I conclude that Lewis's argument for foundationalism is unsound.

1. The Argument

One of the most clear and concise statements of Lewis's defense of the nothing probable principle is found in his contribution to the Lewis-Reichenbach Debate, entitled, "The Given Element in Empirical Knowledge." The argument is a *reductio ad absurdum* proceeding from the assumption that there are statements which are justified even though none is certain. Lewis argues:

A. ...a statement justified as probable must have a ground; if the ground is only probable, then there must be a ground of it; and so on (*ad infinitum*).

Thus,

B. ...to assess the probability of the orig-

> inal statement its probability relative to its ground must be multiplied by the probability of this ground which in turn must be multiplied by the probability of its ground; and so on (*ad infinitum*).[5]

Lewis seems to continue[6] by claiming that if (B) is true, then the probability of every empirical statement approaches zero; and as this is impossible,[7] it must be the case that nothing is probable unless something is certain.

In his contribution to the 1951 debate, Reichenbach asserted that this argument fails to establish the desired conclusion for (B) is false. But before we turn our attention to this objection, we should briefly examine the connection between justification and probability which motivates Lewis's rejection of coherentism.

To say that a person is justified in believing a statement, according to Lewis, is to say that the degree to which the person is justified in believing it is high or that its probability is high. Lewis further explains that if a person is justified in believing a statement, then either the statement is probable or the statement is certain. A statement is probable if and only if there is some other statement, its ground, which the person is justified in believing and the probability, i.e., the conditional probability, of the former statement given the latter statement is high. Lewis claims that the degree to which one is justified in believing a statement which is certain for him is equal to one, which amounts to saying that if a statement is certain for a person, then its probability is equal to one.

The following illustration may help to clarify Lewis's position. Consider a person, Jones. There is a function which assigns to statements the degree to which Jones is justified in believing them given his background knowledge; let us call this function P. P is a probability function which means that P assigns to statements numbers which are less than or equal to one and greater than or equal to zero. These assignments must conform to the rules of the probability calculus. P also assigns values to pairs of statements, i.e., P also measures the degree to which Jones would be justified in believing a statement if a certain statement were added to his background knowledge. If Jones is justified in believing a statement, p, then P assigns to p a number that is greater than .5, i.e. $P(p)>.5$. If Jones is justified in believing a statement, p, and if p is probable for Jones, then there is some statement, q, such that Jones is justified in believing q, $P(q)>.5$, and P assigns to the pair (p,q) a value greater than .5, $P(p,q)>.5$.

2. Reichenbach's Objection

In "Are Phenomenal Reports Absolutely Certain?" Reichenbach attempts to cast doubt on the soundness of Lewis's argument by showing that (B) is tenuous. In doing this, Reichenbach makes it clear that he takes (B) to assert

B1. The probability of any statement, p, is equal to its probability relative to its ground, q, multiplied by the probability of q relative to its ground, r; and so on, i.e., $P(p)=P(p/q)\cdot P(q/r)\cdot P(r/s)\cdot\ldots$

Reichenbach seems to think that Lewis had carelessly presupposed that the probability of a statement is equal to the product of its probability relative to its ground and the probability of its ground, i.e., $P(p)=P(p/q)\cdot P(q)$. As the assumption for the _reductio_ was that all statements are merely probable, which on Lewis's view amounts to the claim that every statement has a ground, we see that the expression $P(q)$ in the statement $P(p)=P(p/q)\cdot P(r)$, may be replaced _salva veritate_ by the expression $P(q/r)\cdot P(r)$, where r is the ground of q; similarly $P(r)$, which occurs in the statement that resulted from the preceding substitution may be replaced with $P(r/s)\cdot P(s)$, where s is the ground of r; _ad infinitum_. We may now see that, given the assumption from which the argument proceeds, it may be concluded that the probability of any statement is equal to the product of infinitely many numbers which are less than one and greater than zero, each of these numbers measuring the probability of each statement relative to its ground. According to Reichenbach, Lewis thus proposes that (B1) follows from the assumption which was made for the sake of the *reductio* and a truth about probability. As (B1) entails an absurdity, the desired conclusion may be validly drawn.

Reichenbach's objection may be stated as follows. In order for Lewis to validly infer (B) the probability of a statement, p, must be equal to the product of its probability relative to its ground, q, and the probability of q, i.e., $P(p/q) \cdot P(q)$. But as this is not the case, since $P(p)=P(p/q) \cdot P(q)+P(p/{\sim}q) \cdot P({\sim}q)$, Lewis's argument is unsound.

3. Van Cleve's Defense

James Van Cleve, in a recent paper entitled "Probability and Certainty: A Reexamination of the Lewis-Reichenbach Debate," sets out to defend Lewis by claiming that Reichenbach misunderstood the point of the argument. Van Cleve writes:

> According to the interpretation of the argument in section ((2)), Lewis fears an infinite regress of grounds because he thinks the probability of the original statement would eventually dwindle down to nothing. But I think he fears the regress for a different reason: it would prevent us from

determining probabilities at all.[9]

Van Cleve asserts, and some of the textual evidence supports his claim,[10] that Lewis is concerned with the link between justified belief and the computability of the probabilities in question. Van Cleve seems to think that the point on which Lewis's argument turns is that computability by successive applications of the rule of elimination is constitutive of the very concept of probability.

Van Cleve's proposal amounts to the suggestion that (B) should be replaced with

B2. If a statement is probable, then its probability must be computable by successive applications of the rule of elimination.

This premise is intended to assert that a statement is probable only if its probability can be calculated by multiplying the probability of the statement relative to its ground by the probability of its ground and adding to this the product of the probability of the statement relative to the denial of the ground and the probability of the denial of the ground, which can be done only if either the ground is certain or its probability is calculated in a similar manner; _ad infinitum_. The argument is now understood as proceeding with the claim that, as it has been assumed that there is an infinite regress of grounds for any statement, the probability of any empirical statement cannot be computed by successively applying the rule of elimination. Given (B2) we may infer that no empirical statement is probable, and hence, none is justified, which contradicts the assumption for the *reductio*. Therefore, it may be concluded that nothing is probable unless something is certain. Given a revision along this line, Van Cleve alleges that the argument is sound.[11]

(B2) embodies two claims: (i) that a statement is probable only if its probability can, in principle, be assessed in a non-arbitrary manner, and (ii) that the only non-arbitrary way to assess probabilities is by successive applications of the rule of elimination. While the first claim is plausible, the second is clearly false. Even if there were a regress of grounds, we could assign probabilities by approximating how justified the person is in believing the evidence which he possesses for a certain statement and by approximating how strong the evidence is for the statement. One might wonder how such approximations can be made or at least how they can be made in a non-arbitrary manner. It seems to me that to make such approximations we only need to know certain epistemic rules, i.e., rules of evidence. Many epistemologists, coherentists, as well as foundationalists, concede that there are epistemic rules which are to the effect that if a person, s, believes a statement of kind k in circumstances c, then the degree to which s is justified in believing the statement, i.e., its probability, is n. Chisholm, for example, defends the following rule:

> For any subject S, if S believes without ground for doubt, that he perceives something to be F, then it is evident for S that he perceives something to be F.[12]

Presumably, if such a rule is true, we may know it *a priori*. If we know that this rule is true, then we can make a non-arbitrary assignment of probability to the statement that I perceive something to be red merely by knowing that I believe, without ground for doubt, that I perceive something to be red, and by knowing that the probability of a statement that is evident lies in the interval (.85, 1). A coherentist might propose a principle that differs from Chisholm's in that the circumstances that must obtain for a perceptual statement to be evident are, for example, that the statement best explains certain (perhaps infinitely many) of the person's other beliefs. It must be noted that both of these principles are compatible with the thesis that there is an infinite regress of grounds for every empirical statement. The details of these principles, however, are not relevant to the point which I am advancing. The truth of the matter appears to be that we may make non-arbitrary assignments of probability without employing the rule of elimination. Therefore, (B2) is tenuous and Van Cleve's gambit is unsuccessful.

4. Pastin's Suggestion

In his paper, "C.I. Lewis' Radical Foundationalism," Mark Pastin suggests another line of defense for Lewis. He defends the move from (A) to (B) as follows:

> But, if G is probable for S at t, then S must have a "ground" G_1 of G, and so on, as long as we have probable grounds. If S is to accept P at t, then S should be able to accept $\ldots \& G_i \& \ldots \& G \& P$, the conjunction of P and all its "grounds". Again by the Multiplication Axiom, the probability of $\ldots \& G_i \& \ldots \& G \& P$ is given by the formula:
> (2) $P(\ldots \& G_i \& \ldots \& G \& P) = \ldots x P(G_{i-1} / \ldots \& G_i)$ $x \ldots x P(P / \ldots \& G_i \& \ldots \& G)$.[13]

Pastin claims that the principle which legitimizes the inference is the multiplication axiom of the probability calculus and not the rule of elimination. Thus, if this is correct, Reichenbach's objection misses the point completely.[14]

I suggest that this line of defense depends on the truth of the following principle:

P. If an empirical statement is probable, then the conjunction of the statement and all of its grounds is probable.

One might suspect that this principle succumbs to the lottery paradox,[15] and hence, that it is unacceptable. However, Pastin is careful to point out that this principle should not be confused with a principle to the effect that if two statements are acceptable, then so is their conjunction. I assume that he does this because he thinks that even though the latter principle falls victim to the lottery paradox, the former does not.

Even though a lottery paradox may not be generated using (P), I suggest that this principle may not be used in defense of Lewis's argument. We should recall that, according to Lewis, one is justified in believing a statement only if the probability of the statement is high. He seems to think that this is true because he takes probability to be a measure of the degree of rational belief. Moreover, Lewis believes that these probability-values conform to the laws of the probability calculus. For example, a consequence of the multiplication axiom is that a conjunction of many statements, each of which is probable but not certain, cannot be probable, and hence, one cannot be justified in believing such a statement. This is the case even when the atomic parts of the conjunction are not inductively inconsistent.

Moreover, it is a consequence of Lewis's view that there is some minimum probability-value that must be obtained for a statement to be probable. Some may deem these consequences of Lewis's view unacceptable, but we must keep in mind that we are attempting to evaluate Lewis's argument which employs his conception of justification.

It seems to me that (P) does have some intuitive appeal, for it sounds like a principle which asserts that if a person is justified in believing a statement, then he is justified in believing the conjunction of the statement and all of its grounds. This latter principle is one that is endorsed by those who reject the view that a person is justified in believing a statement only if the statement is highly probable. In support of their claims, philosophers of this persuasion sometimes endorse a more general principle, i.e., that if a person is justified in believing two statements, then he is also justified in believing their conjunction. But we must remember that the intuitions which lead one to endorse this view cannot be invoked in support of Pastin's suggestion, for they are antithetical to Lewis's views concerning justified belief, i.e., such intuitions may be employed in attempting to establish that Lewis's argument is unsound, for its premises entail falsehoods concerning justification.

A defender of Lewis should reject (P) for the following reason. According to Lewis's view, if a statement q is the ground of p, then q must be probable and the conditional probability of p given q must be high. Why, then, should it follow from the fact that a statement is probable that the conjunction of the statement and its ground is probable as (P) implies? Suppose, for example, that q is probable, but only to a degree that barely crosses the threshold to justify the person in believing it. Further, suppose that the conditional probability of p given q barely reaches the threshold that must be obtained for q to be the ground of p. In such a case, p would be probable and q would be probable, yet, their conjunction would not be probable. As such a situation is possible (at least given Lewis's assumptions), P appears to be tenuous. Therefore, Pastin's suggestion appears to be one that will do Lewis no good.

5. Lewis Defended

In "The Given Element in Empirical Knowledge," Lewis hints at another line of defense from Reichenbach's objection. Lewis seems ready to concede that Reichenbach was correct in asserting that, in general, it is not the case that the probability of a statement, p, is equal to the product of its probability relative to some other statement, q, and the probability of the other statement, but, rather, that the probability of a statement is determined by the rule of elimination, i.e., $P(p) = P(p/q) \cdot P(q) + P(p/{\sim}q) \cdot P({\sim}q)$. It seems to me that Lewis is willing to replace (B) with

B3. For any empirical statement, p, there is some empirical statement, q, which is the ground of p, such that $P(p) = P(p/q) \cdot P(q) + P(p/{\sim}q) \cdot P({\sim}q)$; and there is some statement, r, which is the ground of q, such that $P(q) = P(q/r) \cdot P(r) + P(q/{\sim}r) \cdot P({\sim}r)$; and so on.

Lewis explains that

> Reichenbach denies that the regressive series of probability-values so arising must approach zero, and the probability of the original statement be thus whittled down to nothing... However, even if we accept the correction which Reichenbach urges here, I disbelieve that it will save his point. For that, he must prove that where any such regress of probability-values is involved, the progressively qualified fraction measuring the quaesitum will converge to some determinable value other than zero; and I question whether such a proof can be given.[16]

We see that Lewis maintains that if (B3) is true, then the probability of every empirical statement still approaches zero. This amounts to claiming that (B3) ultimately reduces to the claim that the probability of any statement is equal to the product of the conditional probabilities of the statement and all of the grounds given their respective grounds, i.e., it ultimately reduced to (B1). There is an arguemtn which Lewis could have employed in support of this claim. He could have argued that the conditional probability of any statement given that its ground is false is zero, thereby showing that the second summand in each of the relevant instances of the rule of elimination is equal to zero.

Lewis could defend the claim that the conditional probability of any empirical statement given that its ground is false is zero by appealing to his conception of the nature of justification. Lewis propounded a theory which asserted that a statement which implies the existence of a physical object (what he called an objective statement) entails an unlimited number of empirical statements which express possible ways of verifying the objective statement (he called these latter statements terminating judgments). The theory further asserts that if some sufficient, but finite, number of terminating judgments are rendered evident, the objective statement which entails the terminating judgments is also rendered evident (the number of terminating judgments required to render an objective statement evident varies according to the person's background knowledge. Thus, a conjunction of terminating judgments serves as the ground of an objective statement. Since it is true that if a statement p entails another statement q, the conditional probability of p given that q is false is zero, we may conclude that if the ground of an objective statement is a conjunction of terminating judgments, the conditional probability of the objective statement given that its ground is false is zero.

In defense of Lewis, we may draw certain general conclusions about the justification of empirical statements from his theory of objective statements. All empirical statements are rendered evident when certain of their implications are verified. Their implications are subjunctive conditionals which assert that if a certain sort of test were performed, a certain result would be obtained. Thus, the ground of every empirical statement would be a subjunctive conditional (or a conjunction of the same) which is implied by the statement. As this is the case, the probability of every statement given that its ground is false is zero.

6. Conclusion

We have seen that Lewis had an interesting response to Reichenbach's objection; this response was suggested by Lewis and never considered by Reichenbach. For this reason, it is not at all clear that Reichenbach emerged victorious from the Lewis-Reichenbach debate. However, the foregoing response to Reichenbach's objection depends on the truth of phenomenalism. As it will be shown in chapter three that Lewis's phenomenalism is untenable, one should not jump to the conclusion that Lewis was the victor in the debate. Therefore, I conclude that although there was a gambit which Lewis seems to successfully employ against Reichenbach, this gambit ultimately fails for reasons that neither was cognizant of.

Footnotes

1. There are versions of coherentism which entail that all of the statements that we are justified in believing are certain. It seems that Lewis thought that such theories did not even merit consideration.

2. Cf. C.I. Lewis, An Analysis of Knowledge and Valuation, (Open Court Publishing Company, La Salle, Illinois, 1946), pgs. 186-187, 289, 333.

3. Cf. C.I. Lewis, "The Given Element in Empirical Knowledge," The Philosophical Review, 61 (1952), pgs. 169-175; and Hans Reichenbach, "Are Phenomenal Reports Absolutely Certain?" ibid., pgs. 147-159. (Nelson Goodman also participated in this symposium, however, his contribution will not be discussed in this chapter). These papers are reprinted in Roderick M. Chisholm and Robert J. Swartz (eds.), Empirical Knowledge, (Prentice Hall, Englewood Cliffs, New Jersey, 1973), pgs. 348-375.

4. James Van Cleve, "Probability and Certainty: A Reexamination of the Lewis-Reichenbach Debate," Philosophical Studies, 37 (1977), pgs. 323-334; and Mark Pastin, "C.I. Lewis' Radical Foundationalism," Nous, 9 (1975), pgs. 407-420.

5. Chisholm and Swartz, pg. 372.

6. It is not completely clear how the argument is intended to proceed from (B). A number of ways of reconstructing this argument will be considered.

7. It is assumed that the negation of an empirical statement is an empirical statement. Suppose, then, that p is an empirical statement and that its probability approaches zero. As a theorem of the probability calculus asserts that the sum of the probabilities of a statement and its denial is equal to one, the probability of the denial of p must approach one. From these considerations it follows that the probability of every statement cannot approach zero.

8. Chisholm and Swartz, pgs. 352-353.

9. Van Cleve, pgs. 327-328.

10. Notice that in (B) Lewis uses the phrase 'to assess the probability.'

11. Van Cleve does not exactly say this. He claims that the argument renders plausible the conclusion that nothing is justified or probable unless something is either certain or intrinsically justified. As nothing that I say about Van Cleve's proposal turns on this point, I do not bother to amend the conclusion in this manner.

12. Roderick M. Chisholm, Theory of Knowledge (second edition), (Prentice Hall, Englewood Cliffs, New Jersey, 1977), pg. 78.

13. Pastin, pg. 413.

14. It should be noted that there is no textual evidence to support the claim that Lewis was implicitly invoking the multiplication axiom.

15. Cf. Henry E. Kyburg, Jr., Probability and the Logic of Rational Belief, (Wesleyan University Press, Middletown, Conn., 1961), pg. 197.

16. Chisholm and Swartz, pg. 372.