The Lottery Paradox, the Preface Paradox and Rational Belief.

by

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CONTENTS.

ABSTRACT.

Traditionally rationality has been analysed in rather puristic terms; thus rational acceptance has been presented as unsullied by the demands of competing claims - the only demand admitted generally being truth ('Do not have false beliefs'). Such a view leads us to the straightforward rejection of the thesis that a rule of detachment for probability statements is sufficient to explicate rational acceptance; since such a rule leads, apparently unavoidably, to the lottery paradox. (Lottery Paradox: Accept only those propositions whose probability is shown to be greater than $^{N-2}/_{N}$. N people enter a lottery, therefore the probability of an individual losing is $^{N-1}/_{N}$; this goes for each separately and so we may accept that each will lose, and so that all will lose. But we know that this is false.).

The appeal of this rather contemptuous treatment diminishes in the face of the Preface Paradox. (Preface Paradox: A man writes the following, eminently reasonable, lines: Each of the propositions I assert in this book I believe to be true; but I am also sure that some will be proved false.). If we reason as before we have to accept the impossibility of rational belief.

The two paradoxes are examined in detail and their consequences spelt out in Chapter One; giving us two alternatives:

(1) To show, despite appearances, that neither set of beliefs is inconsistent.

or (2) To show some difference between the two paradoxes that enables the traditional view of rationality to separate them.

(1) is rejected, and (2) in the course of the same argument, in Chapters Two and Three, where we formulate a

continued ....

criterion for the consistency of sets of beliefs, defend it against apparent counter-examples, (versions of Moore's Paradox) and demonstrate that both sets of beliefs are inconsistent. This despite attempts by some, notably Kyburg, to show the opposite.

If we are to avoid concluding rationality bankrupt, and yet maintain our original reaction to the rule of detachment we must do two things:

(a) reject the rule of detachment on grounds other than the Lottery paradox.

(b) give an account of rationality that will accommodate the Preface paradox.

In Chapter Four we justify (a) by considering the asymmetries that can be shown to exist between the syntax of the classical probability calculus and the syntax of confirmation in ordinary language, and by pointing to the difficulties encountered in giving an adequate semantics to such a calculus when cast in the role of a calculus of confirmation.

Finally, in Chapter Five, we present a more complex account of rationality, capable of accommodating the Preface Paradox, one which takes seriously the diverse needs of human beings.

Chapter One

An Introduction to the Lottery and Preface Paradoxes.

It has been a traditional topic of discussion among epistemologists whether, or not, our beliefs, or some of them, could be rational; and, if they could, under what conditions. Attempts have been made, by presenting various sceptical arguments, to show that some, or indeed, most of our beliefs are irrational, and could not be otherwise. Such arguments as are offered run something along the following lines: most of our beliefs are obtained by non-deductive inference, non-deductive inferences are unjustifiable - for reasons A,B,C... - hence irrational, therefore most of our beliefs are irrational. We may counter arguments of this type by attempting to show that in each case the second premiss is false, or we may reject this piecemeal attack in favour of some more general criticism that may be levelled at any argument of the above type - that is no matter how A,B,C... are filled in. It is this second approach that is taken by P.F. Strawson in his book Introduction to Logical Theory where he says the following:-

> We have already seen that the rationality of induction, unlike its 'successfulness', is not a fact about the constitution of the world. It is a matter of what we mean by the word 'rational' in its application to any procedure for forming opinions about what lies outside our observations or that of available witnesses. (a)

But by stating, as he does, that it is part of the meaning of the word 'rational' that the processes by which we characteristically acquire our beliefs are rational, Strawson scarcely takes the argument beyond counter-assertion: and in an attempt to take the argument further there has grown up a vast literature on the nature of rational inquiry. On the assumption, of course, that

(a) pp.260-61

rational inquiry terminates in rational belief and hence that a characterisation of the nature of rational inquiry will, at least, provide a basis for an answer to the question 'Can human beings have rational beliefs?'

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In the course of this debate there have been discovered two paradoxes, which threaten either to decide the debate on the side of the sceptic, or to reveal some unexpected complexities in our concept of rationality. It is to these two paradoxes and their consequences that we address ourselves. But before we do so we must first conduct a few preliminaries in order the more precisely to delineate the scope of our investigations.

The predicate '- is rational' can be applied to a bewildering variety of things: acts, beliefs, bets, commands, decisions, animals and so on. From this fact and from the central place the concept of rationality has, it would seem reasonable to suppose that an account of that nature of rational belief is not to be had by first finding an account of rationality and then applying it to the particular case of belief. But, rather, that investigations must take place in the reverse order. Thus it is that an analysis of the nature of rational belief will shed light on the problem of producing a general unitary account of rationality.

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We will get an idea of what is involved in this narrowing down by considering what happens when an individual comes to believe a proposition. In some etiolated sense of the word 'decision' when an individual comes to believe a proposition, say p, he may be said to have provided himself with an answer to the question 'May I, or may I not, believe p?' There are some quite obvious factors involved ~~here~~ in making this decision, for example, the nature of evidential support. However, it is at least conceivable that there are other, less obvious, factors involved. Consider the proposition 'Negroes have innately inferior intellectual capacities to Caucasians', now it might be the case that with respect to some general unitary account of rationality the decision to believe such a proposition would involve moral considerations, over and above considerations about the adequacy of the available evidential support. Or, what probably provides a more plausible example, the decision to believe some proposition, p, might involve some religious considerations independent from the evidential support available for p. It is considerations like these that we are not concerned with; we are concerned with rationality not as it deems justified, or not, the acceptance of a proposition, but only in so far as it deems justified accepting a proposition to be true. Let us call a belief that is rational on these grounds an epistemically rational belief. Even given such a narrowing as this the nature of rational belief is a large topic, so it is by no means our concern to present an exhaustive account of it. Rather we will concentrate on those aspects important to the two paradoxes; one which casts doubt on a particular partial description of epistemically rational belief, the other which casts doubt upon the success of any attempt to give an a priori description of epistemic rationality.

Suppose we consider some individual's belief in a particular proposition. It would seem reasonable to suppose that it's epistemic rationality will depend upon two features. One, its relationship to the other beliefs that the individual has and, two, the nature of the support that the individual has for that belief. Given these two aspects to the rationality[a] of a belief we can see, in a general way,

(a) From now on by rationality I shall mean epistemic rationality unless stated otherwise.

the sort of problems to which the two paradoxes give rise. In each case we suppose that the rationality of one aspect is determined in one sort of way, and in each it is apparently shown that this leads to situations in which the believer acquires beliefs that are manifestly unsatisfactory in the other aspect. But before taking this any further let us give an account of the two paradoxes.

First the preface paradox, which runs as follows: a man, A, writes a book and sincerely believes every proposition he asserts in it, on what he considers to be good grounds. However, he also considers that his book is no exception to the general 'rule' that long books contain some falsehoods, again on what he takes to be good grounds. He, therefore, writes a modest preface in which he says that although he sincerely believes that each proposition he asserts in the book is true, he is also sure that some are false. However, it would appear fromthis that the writer is committed to holding logically conflicting beliefs. He is committed to believing that all the propositions he asserts in the book are true and to believing that not all the propositions he asserts in the book are true.

Let us describe the steps leading up to this situation in detail; $p_i, \ldots, p_n$, being the propositions A asserts in his book.

(1) A believes p_i, because...
A believes p_j, because...
A believes p_n, because...

Now (1) seems to lead to (2).

(2) A believes $p_i, \ldots, p_n$, because, in the case of p_i;...etc.

However, also (3),

(3) A believes there is a p, p_s, such that not-p_s, because...

and (3) seems to lead to (4),

(4) A believes not all $p_1 \ldots p_n$ are true, because ...

And from (2) and (4) we get,

(5) A believes $p_1, \ldots, p_n$ are all true, and not all $p_1, \ldots p_n$ are true because ...

It is to be pointed out that the steps from (1) to (2), from (3) to (4) and from (2) and (4) to (5) are not be construed as entailments, for they are not. It is not the case that if A believes p and A believes q then necessarily A believes p and q. The exact relationship between connected steps in the derivation is; the belief described in ( ) commits A to the belief described in ( ). We will discuss the relation <u>- commits A to believe -</u> later on, in Chapter Two.

But this isn't a relation between the steps of the derivation.

Wherein then lies the paradox? The modest preface writer has simply unwittingly committed himself to holding contradictory beliefs, and on this being pointed out to him he will acknowledge that this is the case and rectify his mistake. The problem, however, lies in the fact that nothing, on the face of it, would appear more rational than to write such a preface. Further, there is no clear alternative that the author can take. How does he rectify his mistake, if mistake it be?

It might seem, at first glance, that A could never be in the position described in (3) unless he also disbelieves one of the propositions asserted in his book. In other words his only grounds for the belief described in (3) must be doubt, or disbelief, in one or other of $p_1, \ldots, p_n$. But this is clearly not the case. For his grounds could simply be, the length of the book, the difficulty of the topic, the number of untruths he has already discovered and corrected, general human fallibility, the rapidity with which discoveries are made in that topic, and so on. Equally well we do not want to say that A can only have a rational belief in p_i, and in p_j,...if it is also the case that A cannot have a rational belief that one of them is wrong.

Let us leave the preface paradox for the moment, and turn our attention to the lottery paradox. In the preface paradox we simply characterised A's belief in p as evidentially well-supported, if he had good grounds for p. In the lottery paradox we will be more specific and suggest that A's belief in p is evidentially well-supported, if the probability of p on A's evidence, q, is greater than some figure, say w. The lottery paradox runs as follows: a man, A, takes part in a lottery in which N-1 people, other than A, also take part. So that A's chances of losing are N-1/N, and, let us suppose, that N-1/N is greater than w. It will follow from this that A may believe that he will lose. But by the same token since the chances of losing are the same for each competitor A will be committed to believing of each competitor that he will lose. However, A may also believe that someone will win, since these are the rules of the lottery. A, therefore, seems to be committed to holding logically conflicting beliefs, the belief that everyone will lose, and also, the belief that not everyone will lose. Setting the paradox up in full; where q_1,...,q_n are, A will lose, B will lose,... etc. we have:

(1)' The probability that q_1, is N-1/N (greater than W.) thus A may believe q_1.

(2)' The probability that q_2, is N-1/N (equal to the probability that q_1.)

Thus A is committed to believing q_2.

⋮

The probability that q_n, is N-1/N (equal to the probability that q_i)

Thus A is committed to believing q_n.

From (1)' and (2)' we are led to (3)'.

(3)' A believes $q_1, \ldots, q_n$.

However,

(4)' A believes that the probability of $(q_1, \ldots q_n)$ equals nought.

and A believes that the probability of not $-(q_1, \ldots, q_n)$ equals one.

Therefore,

(5)' A may believe not $-(q_1, \ldots, q_n)$

But from (3)' and (5)' A is led to (6)'

(6)' A believes $(q_1, \ldots, q_n)$ and not $-(q_1, \ldots, q_n)$.

In the lottery case we have a situation in which we hoped to confer rationality upon some of our beliefs by adopting a rule of acceptance, in this case a rule of detachment for probability statements. Namely, accept only those propositions whose probability is correctly believed to be greater than W. However, as we have seen, its application in certain situations seems to lead us inexorably to accumulating manifestly unsatisfactory sets of beliefs.

It might seem, from the example, that the situation is entirely artificial and that a rule of detachment is very implausible, but we shall leave until Chapter Four the discussion as to why it came into the debate.

We pointed out earlier on that the rationality of a belief held by an individual depended upon, at least, two things; the evidential support that he provided for it, and its relation to the other beliefs that the person holds. Now it is completely artificial to suggest that these two considerations are entirely independent,[a] but if this were the case neither paradox would present difficulties. For we would have two sets of rules, one conformity with which produced sufficiently grounded beliefs, the other conformity with which ensured that such beliefs accumulated were compatible. Thus given a situation in which the rule of rational acceptance says we may accept two incompatible propositions, we would simply turn to our second set of rules to see which proposition to accept. However, unless we are prepared to accept a position in which this second operation is quite arbitrary, it is clear that considerations appropriate to the first process are equally appropriate to the second. It would seem, therefore, that both operations must be adequately covered within a theory of inference, not one within and one without.

It is precisely this point that Hempel, a philosopher with high hopes as regards the detachment rule as a rule of rational acceptance, acknowledges in giving his formulation of the conditions which need to be satisfied by any adequate candidate rule of acceptance. These are as follows:

C.R.1: Any logical consequence of a set of accepted statements is itself an accepted statement; or K contains all logical consequences of any of its sub-classes.

C.R.2: The set of accepted statements (K) is logically consistent.

C.R.3: The inferential acceptance of any statement, h, into (K) is decided upon by reference to

(a) These points will be elaborated further in Chapters Two and Four.

the total system K.[a]

Once we have accepted that there exist close links between these two aspects of the rationality of a belief, as Hempel has done here in C.R.2, then we are open to the full force of the two paradoxes. Thus the lottery paradox would seem to suggest that a rule of detachment for probability statements must be rejected as a rule of rational acceptance. And, more disastrously, the preface paradox would seem to suggest that nothing that could be substituted for this rule would fare any better. In other words, the conclusion we are apparently forced to, unless we can find some satisfactory way out of the two paradoxes, is that there can be no _a priori_ theory of rationality, no _a priori_ guarantee that some of our beliefs are rational. This may not seem, at first sight, an obvious consequence of the preface paradox. But if we extract its essentials from the slightly artificial surroundings within which it has been placed, it will certainly become obvious. If we let U be the total set of an individuals beliefs then it would seem reasonable that for some sub-sets of U the individual may have the further belief that such sub-sets contain some false beliefs. (Clearly this cannot hold for all sub-sets of U, for then it would be possible for the individual to hold of each belief that it was false; but, equally, it is clear that this is possible for some sub-sets.) For example, it would seem to be rational, indeed of the very essence of rationality, that one should hold that some of one's beliefs were mistaken, such a belief would be tantamount to denying the truth of the conjunction of all the propositions one believes. This would be the case _whatever_ the origin of our beliefs; that is whatever rule of inductive acceptance

(a) Given in Hempel 'Deductive-Nomological v's Statistical Explanation in _Minnesota Studies in the Philosophy of Science III_ (ed. Feigl and Maxwell) Minneapolis 1962.

we employed. Thus it would seem that whatever the rule of rational acceptance we adopted we could not help avoid arriving at some such similar position to that described in (5); Hence we cannot help conflicting with criterion C.R.2 of Hempel's requirements for a rule of rational acceptance.

When Hempel gave his three requirements for a satisfactory rule of acceptance he also tentatively suggested the following rule for consideration:

(D_h) Accept, or reject, h given K according as to C(h,k) is greater than $\frac{1}{2}$ or C(h,k) is less than $\frac{1}{2}$; when C(h,k) equals $\frac{1}{2}$ h may be accepted, rejected or left in suspense.

Historically the lottery paradox was formulated by Kyburg not as an attack on (D_h), or similarly inspired rules of acceptance, but as an attempt to show the deficiencies of C.R.1., C.R.2., and C.R.3. The argument given being something along the following lines: either we accept the conditions C.R.1, C.R.2 and C.R.3, or we accept (D_h), or something similar, but not both; (D_h), or something similar, is clearly the best we can do, so we must reject C.R.1, C.R.2 and C.R.3 as conditions that each have to be satisfied. A complete evaluation of this argument would, of course, have to include an evaluation of such steps as were thought to lead up to it, and this we must leave until later, when in chapter (4) we give some discussion of the nature of epistemic reasoning. But at the very least, we can suggest that such an argument misses one or two points. For it is not at all clear that the conditions Hempel describes are adequate on grounds independent ~~from~~ the lottery paradox. All the conditions seem to demand is the consistent closure under deduction of the set of propositions an individual believes, when accumulated in accordance with a candidate rule of acceptance.

However, it is quite clear that as a characterisation of the necessary and sufficient conditions for the satisfactoriness of some rule of acceptance it is quite inadequate. At the very least we would want to say that unless epistemic reasoning can be shown to have some bias towards accumulating true propositions rather than false ones then we can have no grounds for thinking it either is or can be rational.[a] In other words as against the sceptic who argues that all non-deductively grounded beliefs are irrational, that no matter what inductive policies are implemented we are no more rational in believing that we have got to the truth, having implemented them, than if we had not; we want to argue that if we implement some particular inductive policy then we are quite justified in believing that we have come to a true belief.

~~And~~ In order for C.R.1, C.R.2, and C.R.3 to be considered as a sufficient characterisation of the conditions to be met by any rule of rational acceptance, it would have to be shown that there is some correlation between holding consistent beliefs and holding true ones. A correlation we are quite justified in thinking does not exist. In fact given Hempel's rule and C.R.1, C.R.2, and C.R.3, as we shall see in Chapter Four, there is good reason for thinking that quite the opposite is the case. But until we get one account, or partial account, of the goals and norms of rational inquiry we are not in a position to see how C.R.1, C.R.2, C.R.3 are to be altered, if indeed they are to be altered rather than simply added to.

So far we have simply described the two paradoxes, and indicated those points in the structure of epistemic rationality that the two paradoxes show to be less well understood than

(a) We will elaborate this point to some extent in the next chapter.

might otherwise be thought. How can we carry on from here? It would seem to me that despite the obvious similarity between the two paradoxes, there is an obvious difference between them. The difference is that the lottery paradox vitiates the rule of detachment whereas the preface paradox does not vitiate the possibility of rational belief. Granted this intuitive response, what we have to do is to discover what it is that is wrong in the lottery case, and then show that it is not also wrong in the preface case; and then to show why, or how, the beliefs in the preface case may be shown to be rational.

Because the two paradoxes lie at the bottmm of the debate on rational belief they are thereby connected to a large number of topics: consistency in belief, inductive acceptance, belief, rationality, the status of logical laws in reasoning, the ethics of belief, decision theory, and so on. This means that it is not possible to effect a simple linear development of the plot which leads, I hope, to the solution, instead we will find it necessary to take a number of diversions from time to time. I say this in order to justify in advance the devious development of the discussion.

Ĉhapter Two

Consistency and Belief.

Part (i) Consistency.

In describing the genesis of the two paradoxes we showed that an individual who started off with a certain collection of beliefs was thereby led, apparently inexorably, to holding further beliefs, the resultant set of beliefs being faulty, or objectionable, in some way. We should therefore make an attempt to describe precisely what this fault is. In other words, to explicate the notion of consistency as it applies to sets of beliefs. At the end of the investigation we will not be able to draw any very startling conclusions; for example we will neither be able to say that the two paradoxes are distinguishable in terms of consistency, nor will we be able to say that neither of the two sets of beliefs is inconsistent. But although all we will be able to say is that the two sets of beliefs are inconsistent, which we knew already, the discussion will clarify the role which being consistent plays in rational belief.

Let us adopt the following notation:

'B(a)p' for 'A believes that p'.

'C(a)B(a)p' for 'A is committed to believing p.'

There is some slight ambiguity about 'A is committed to believing p', so in order to avoid any confusion it is to be read

Infinite regress? [illegible]

as '<u>A is committed to, the fact that A believes p</u>'.

Further, let us use the following:

'B(a)' for 'the set of A's beliefs'.

'PB(a)' for 'the set of propositions A believes'.

What is it to be committed to a proposition?

and, 'PCB(a)' for 'the set of propositions A is committed to'.

The general notion of consistency is as follows: a set of propositions is consistent if and only if they can all be true.

But this will not do for beliefs, for the most bizarre sets of beliefs can exist under these conditions, for example (B(a)p,B(a)not-p,...). The fact that p is incompatible with not-p, does not stop it being possible for A to believe p and believe not-p. That is to say, a consistent set of belief-ascriptions is not a sufficient condition for a consistent set of beliefs. However, this characterisation of consistency lends itself to an obvious extension for sets of beliefs. Namely, a set of beliefs is consistent if and only if the set of propositions believed can be held to be true, at the same time, by the same person. This is all very well, but what use can we make of this? Perhaps, with a great deal of practice it is possible to get oneself in a state of mind in which one believes everything. It would seem that this extension presupposes a characterisation of consistency rather than constitutes one. So let us simply adopt the following as a criterion of consistency for beliefs and see what can be made of it:

But then beliefs can't all be true.

(C) A set of beliefs, B(a), is consistent if and only if the set PCB(a) is such that if p is an element of PCB(a), then p is consistent.

But PCB(a) is to not contain any of his beliefs [illegible] any pair of them.

Why doesn't this reduce to the definition for propositions?

This formulation of consistency is to be preferred to the intuitively more plausible formulation: A set of beliefs, B(a), is consistent if, and only if, the set PCB(a) is such that any sub-set of it is consistent. (C) is to be preferred in order that we ~~xxx~~ should not beg any questions about the composition of PCB(a).

It is quite clear that the strength, or scope, of (C), in terms of what range of types of sets of beliefs it characterises as inconsistent, depends on what principles of commitment we adopt, and so far we have said very little about these. Two plausible principles are:

(Conj) (i) If $B(a)p$ and $B(a)q$, then $C(a)B(a)(p \text{ and } q)$
(ii) If $C(a)B(a)p$ and $C(a)B(a)q$, then $C(a)B(a)(p \text{ and } q)$.

(Imp) (i) If $B(a)p$ and p entails q, then $C(a)B(a)q$.
(ii) If $C(a)B(a)p$ and p entails q, then $C(a)B(a)q$.

We will argue in support of these and a number of other principles of commitment in Chapter Three, but for the moment let it be borne in mind that these are principles we are assuming. We may also notice that (C) in conjunction with (Conj) is equivalent to the intuitive notion of consistency given above.

At this point it might be argued that we have been a little precipitous and that there are considerable difficulties raised by the notion of believing a contradiction, or even simply believing p and believing not-p at the same time. For example Pap, in his book Semantics and Necessary Truth, argues that it is not logically possible for someone to believe p and to believe that not-p. He says:

> " ... if someone reports that he believes that not-p, we all deduce analytically from the report that he does not believe that p; no psychological assumptions about the working of his mind is needed to justify the inference."[a]

So according to Pap, to say of someone that they believe p and that they believe not-p is to say that they both do and do not believe p. It might even be suggested that the above argument provides us with a very simple solution to the two paradoxes we are considering, that is that neither constitutes a logically possible state of affairs. However, let us be quite clear about the scope of the above argument, consider the following

(a) p.172

four cases:

(a) B(a)(p and not-p).

(b) B(a) p and B(a)not-p.

(c) B(a)(pand not-q). (Where p is equivalent to q.)

(d) B(a)p and B(a)not-q. (Where p is equivalent to q.).

Now Pap's argument isagainst the possibility of holding explicitly contradictory propositions; against (a) and (b) being possible cases, not (c) and (d). However, it is by no means clear that Pap is correct and Quine, for one, has advocated the possibility of (b).[a] What is clear is that there is certainly something very odd about both (a) and (b). But if we consider certain situations, perhaps it is not so obvious that we would want to say that both (a) and (b) describe impossible situations. Thus if a man believes ~~p~~ not-p and unconsciously believes ~~not-p~~ p; as one might want to say if someone unconsciously remembered that p and believed that not-p. Further discussion of this point is irrelevent for our purposes for it is not crucial that we decide either way on the matter. All that is necessary for our purposes, that is for (C), is that C(a)B(a)(p and not-p) be a consistent proposition. If it is thought that this is doubtful because of the inconsistency of (a) or (b), or both, then so much the worse for such arguments as attempts toshow the inconsistency of (a) or (b). Equally well the same points go to show that a rejection of (a) or (b) as possibilities does not show that the situation described in either the lottery paradox or the preface paradox is impossible.

Part (ii) Moore's Paradox.

Let us return then to considering (C) as a characterisation of consistency. The only test we can have for the correctness of (C) is to see whether or not it can cope with, or account for, examples of sets of beliefs which we would consider could

(a) p.148, Word and Object (M.I.T. Press, 1964) not be held to be true by one person, at one time, without raising considerable difficulties. And, unfortunately, there is an example to hand which presents problems for (C) namely, Moore's Paradox. In this example someone says someting to the effect 'p, but I do not believe it.' Now there are two, non-equivalent, ways in which this utterance may be symbolised, as B(a)(p and B(a)not-p) or, as B(a)(p and not-B(a)p), each poses a separate problem. Before we go on to investigate possible solutions it is as well that we should be clear about what is going on here. By 'may be symbolised' we mean that the conditions under which utterance is a problem are the same as the conditions under which we are entitled to ascribe the above beliefs. Further it might seem that there are some beliefs of the form B(a)(p and B(a)not-p) and of the form B(a)(p and not B(a)p) that were quite reasonable. For example, situations where 'a' was a description which the individual with the belief did not know applied to him. However, we are only concerned with those cases in which the individual, A, has such a belief such as the above and 'a' is a description which A recognises as applying to him.

Let us take the first version of the paradox B(a)(p and B(a) not-p). Now, since, as we pointed out earlier, the strength of (C) depends upon what principles of commitment we are prepared to adopt, it would seem that we have an easy solution by adopting the following:

(A) B(a)p entails C(a)B(a)p.

and, (B) B(a)B(a)p entails C(a)B(a)p.

Giving us the following solution:

(1) B(a)(p and B(a) not-p)

entails

(2) B(a)p and B(a)B(a) not-p

entails

(3) C(a)B(a)p   by (A)

and

(4) C(a)B(a) not-p by (B)

entails

Well-formed?

||| Delete second B(a)?

(5) C(a) (B(a)p and B(a) not-p)   by (Conj).

This is inconsistent by (C) because (B(a)p and B(a) not-p) is inconsistent, paradigmatically, and occurs as an element of PCB(a).

However, as a means of preserving (C) this is chimerical. Consider the last line: C(a) (B(a)p and B(a) not-p) is inconsistent because (B(a)p and B(a) not-p) ~~are~~ is inconsistent ~~beliefs because they commit A to~~ and appears as an element of PCB(a). This simply is not true, the step is quite fallacious. (B(a)p and B(a) not-p) are inconsistent beliefs because they commit A to 'p and not-p' as an element of PCB(a) and that is an example of an unproblematically inconsistent proposition. It does not follow from this that if (B(a)p and B(a)not-p) is an element of PCB(a) then B(a) is an inconsistent set of beliefs. To say that (5) shows (1) to be an inconsistent belief is to make the assumption, as yet completely unfounded, that the relationship between C(a) (B(a)p and B(a) not-p) and 'p and not-p' is the same as the relationship between (B(a) p and B(a) not-p) and 'p and not-p'.

Doesn't this mis-interpret the symbolism? And isn't this argt invalid?

Before going on to discuss how we might alter (C) to give a solution to Moore's Paradox, let us discuss a more general problem, namely, whether Moore's Paradox is a p roblem for us at all? It would seem reasonable that we should attempt to ground our intuition that Moore's Paradox is related to inconsistent sets

(continues on next page)

of beliefs, before we take any steps to produce a solution.

First of all we must accept that both formulations of Moore's Paradox are possible, that is not self-contradictory, unless we are prepared to accept the following entailments:

(1) B(a) not-B(a)p entails not-B(a)p.

(2) B(a)B(a)p entails B(a)p.

and (3) B(a)not-p entails not-B(a)p.

These, together with the entailment, B(a)(p and q) entails B(a)p and B(a)q, which we have already accepted, would show that both formulations of Moore's Paradox were contradictory propositions. Entailment (1) suffices to get rid of B(a)(p and Not-B(a)p). And entailments (2) and (3) suffice to get rid of B(a)(p and B(a) not-p). However, neither (1) nor (2) can really be considered as at all plausible.

So if an individual, A, has as elements of PCB(a) the propositions p, and B(a)p, what then is the problem? It is probably a universal occurrence that people believe one thing and believe they believe another; this is the case because we are not blessed with transparency of consciousness. However, so what? What is so special about beliefs as objects of belief, or knowledge, that differentiates them from anything else? In other words, we do not find it problematic that p should be the case while B(a)not-p; so why should we find it problematic that B(a)p but B(a)B(a)not-p? Even more succiently, if B(a)p is an element of B(a) and B(a)B(a) not-p is an element of B(a) why may[(a)] not B(a) B(a)not-p simply be a false belief?

Again consider the statement 'p, but I disbelieve it.' construed as B(a)(p and not-B(a)p); we seem to have similar problems with this, but why? Suppose p and not-B(a)p are elements of PCB(a); then once again this would seem to be

[(a)] 'May' here rather than 'is', since we have not accepted that B(a) not-p entails not-B(a)p.

What is problematic is B(a)(B(a)p + B(a)¬B(a)p).

a possibility that we must allow once granting the non-transparency of consciousness. The point is that whereas B(a)(p and B(a)not-p) and B(a)(p and not-B(a)p) both seem problematic in the extreme, it does not seem so problematic that p be an element of PCB(a) and not-B(a)p be an element of PCB(a); both are cases of lack of self-knowledge.[a]

Let us consider the situation in the following way. If I become aware of the fact that I am ignorant about myself in a particular way, that is I become aware that I believe p and that I believe that I do not believe p, then at that moment I cease to be ignorant of myself in that particular way. Or rather, I ought to cease to be self-ignorant. It is important to notice that my being open to censure if I fail to appropriately adjust my beliefs is a point of logical significance. For if I am able to be self-ignorant in this way, without my being open to any particular censure, other than that of being ignorant, then 'belief' ceases to have, or rather, ceases to be able to have a number of functions quite central to our concept of belief. If I believe p, then in some way I accept that p is true; this trivial truth about belief and whatever follows from it is quite crucial to our concept of belief. But it is this that is being denied if we deny that awareness of self-ignorance in the manner described above demands some action - in the way of reorganising his set of beliefs - on the part of the believer. What obscures this fact is the intentionality of belief; if I can believe p when p is false, then why cannot I believe that I believe p when I do not? We are handicapped at this point since we

[a] Lack of self-knowledge rather than self-deception since the latter implies a self-interested lack of self-knowledge.

lack anything that might reasonably be called an analysis of belief, so let us take it that if I believe p then I accept p to be true; this is not supposed to be an analysis but it suffices for our purposes. What we have to show is that if I believe that I believe p then I accept p to be true, in other words that there should be a commitment to p. Thus if I believe p, I accept that p be true, and if I believe that I believe p then I accept that I accept that p be true. In doing so I accept two things, I accept that <u>I accept</u> p to be true, and I accept that I accept <u>p to be true.</u> The commitment is retained despite the intentionality of belief, and this must surely be something an account of intentionality must accommodate. If we deny this then Moore's Paradox apart we get ourselves into severe difficulties. Consider a man who Says 'I believe p'; if we deny that the belief that one believes p constitutes a commitment to p, then we cannot construe this remark, symbolised as B(I)B(I)p, as constituting an affirmation of p; and this is surely very odd indeed.

[illegible]

It follows, therefore, from what we have said that B(a)(p and B(a)not-p) is indeed inconsistent and must be shown to be such by any analysis of consistency in sets of beliefs.

From what we have said we have these two solutions to the two versions of Moore's Paradox.

(1) (B(a)(p and B(a) not-p)

gives us

(2) B(a)p and B(a)B(a) not-p.

(2) gives us

When did this spring from?

(3) C(a)p

and

(4) C(a)B(a)not-p

(4) gives us

(5) C(a)C(a)not-p

(5) gives us

(6) C(a)not-p

(3) and (6) give us

C(a)(p and not-p).

And for the other we have.

(1)' B(a)(p and not-B(a)p)

(1)' gives us

(2)' B(a)p and B(a)not-B(a)p.

(2)' gives us

(3)' C(a)B(a)p

and

(4)' C(a)not-B(a)p.

(3)' and (4)' give us

(5)' C(a) (B(a)p and not-B(a)p).

The principles of commitment in addition to (A) and (B) that we need to guarantee the deductions from (1) to (6) and from (1)' to (5)' are:-

(C) B(a)p entails C(a)p.

(D) C(a)C(a)p entails C(a)p.

and

(E) C(a)B(a)p entails C(a)C(a)p.

Each of (C), (D) and (E) has been argued for above.

This then deals with both versions of Moore's Paradox which we may now take as not being counter examples to (C), since both (6) and (5)' are inconsistent by (C).

<u>Part (iii) Consistency and Rationality.</u>

So far we have developed the notion of a consistent set of beliefs. We must now answer the question: What is the relation between rationality and consistency? It is quite clear that we do not hold someone open to criticism as irrational simply because he has a few inconsistent beliefs that he has not noticed are inconsistent; on the other hand we would not want to say that he was beyond criticism. This is, perhaps, a point worth discussing a little. We are engaged in an attempt to understand why one set of beliefs, those in the lottery paradox, are irrational, whilst another set of beliefs is rational, those in the preface paradox; that is, despite the fact that in both cases the beliefs are, or apparently are, inconsistent. And the suggestion is that if we were to fail to find any difference between them then we would be forced to say that beliefs held by human beings are epistemically irrational. Yet the fact is that we do not hold someone who has a few inconsistent beliefs and a few ill-supported beliefs irrational, we do allow considerable confusion in a man's beliefs before we call him irrational. So we might well wonder why it was that the beliefs described in the two paradoxes were so important.

His condition C) actually makes both lottery beliefs & preface beliefs irrational

The answer to this lies in the fact that if we fail to separate the two paradoxes then we cannot describe a situation in which a man may be said to be beyond criticism. That is to say, no matter what he does , he cannot place himself beyond criticism. So, if this is the case, then we are entitled to cast some doubts on the means whereby he comes to such beliefs. Whereas in the case which we are considering, the man whose beliefs exhibit no more than a certain amount of confusion, the assumption is that he can do something about it. That is, there are no structural defects vitiating his reasoning. The 'can' here is a logical 'can', and the point we are making has nothing to do with the dispute about the possibility of evaluation and 'ought' implying 'can'.

So, if a person's beliefs are beyond criticism then he is ideally rational, if they are criticisable to a certain degree then he is rational; and if beyond this then he is irrational, and if beyond this even further, then it would be difficult to describe such a person as having beliefs at all. It would seem to follow from this that the contribution played by being consistent in being rational, is the contribution it makes towards placing an individual beyond criticism. Thus one of the general normative principles of rational belief, is the injunction 'Do not have false beliefs', or 'Do not make errors', or 'Do not make mistakes', or any one of a number of forms such a principle might take. And clearly one who organises his beliefs in accordance with the principle 'Be consistent' will have gone some of the way towards organising them in accordance with the principle 'Do not have false beliefs'. Some of the way, but not all, since a set of consistent beliefs could all be false. Nevertheless, it is clear that the one, 'Do not have false beliefs', demands the other, 'Be consistent'.

Before we go on there are two points which need to be made about the principle 'Do not have false beliefs'. The first relates to the apparently equivalent principle 'Have true beliefs'. It is quite clear that although we are building up a picture of rationality from the inside, we obviously do not want to include features that are incompatible with any general features we deem to be constituative of our notion of rationality. Now, if we adopted the second principle it would seem that we are endorsing the claim that rationality aims at completeness. That is, the rational believer aims at believing all true propositions. Now, since it is no basis for criticism of an individual that there are some true propositions that he does not believe, it seems eminently reasonable that we should reject any principle that seems to make such a claim. In other words, the rational believer aims at purity of belief rather than completeness. So, despite the fact that we shall show in Chapter Five that there is no difference between these two forms of the principle, we shall retain the former version so as to eliminate any suggestion that we are endorsing a completeness element in rational inquiry.

The second point relates to why we have 'Do not have false beliefs' rather than 'Do not have beliefs you know to be false' as a principle. Now here, of course, the point is the same as we made earlier on, we are describing ideal rationality. (Quite apart from the obvious circularities involved. Thus if 'A knows p' entails 'A rationally believes p' then we cannot include 'know' in our statement of the principles by which we evaluate some belief as a rational one.)

We can say a little more about the role of consistency in rational belief than we have. The demand that one be consistent, in the manner described, is the demand for a certain homogeneity of attitude. Unless a certain homogeneity of attitude is manifested then an individual's belief cannot be said to be discriminatory. Thus the charge of inconsistency will amount to the charge, if you can believe this as well as that then you can believe anything. That is, unless we demand a certain homogeneity of belief, reasoning ceases to be a discriminatory or goal-directed process. But this demand does not entail that the homogeneity to be exhibited should be consistency as we have described it. In order to get this we have to take seriously the fact that when we believe a proposition we believe it to be true. From this we can argue that the sort of homogeneity we ask for is consistency in the fashion described, namely a consistency closely related to the consistency of propositions.

So much then for the principle 'Be consistent', but it is not obvious how such a principle would work out in practice. Consider a man, A, who has a set of beliefs, B(a), and he notices that B(a) is inconsistent: for the sake of argument he believes p and he believes not-p: what should he do? Clearly there are three possibilities; he can reject p, or reject not-p, or reject them both.[(a)] It is hardly a satisfactory solution to suggest that B should arbitrarily drop his belief in p, or his belief in not-p, or both, like a hot potato. So how should B change his mind? The problems involved in describing rational changes of mind are not fundamentally different from those involved in describing what happens when we rationally make up our mind; when we make up our mind we have to decide whether to accept p or not-p or neither. This would suggest that the answer to the problem of how we are to be consistent is to be given by a general theory of inference. Thus just as a general theory of inference must show how our acceptance of particular propositions is not arbitrary, so must it also show how our rejection of particular propositions is not arbitrary. From this we can see that it is a necessary condition of the satisfactoriness of a general theory of inference that it should enable us to be non-arbitrarily consistent. We shall leave further discussion of this until Chapter Four when we discuss inference.

(a)
To reject both p and not-p does not demand believing not-(p or not-p) but simply neither believing p nor believing not-p: such a position is obviously compatible with believing (p or not-p) since B(a) (p or not-p) does not entail ~~C(a)p~~ or ~~C(a) not-p.~~

C(a) B(a) p   C(a) B(a) not-p

At this point let us leave the discussion of consistency and relate what we have said to the original topic. To be able to say after so much effort what we already know to be the case, namely that the beliefs arrived at in both paradoxes are indeed inconsistent, would seem to be a small reward. But we have, I think gleaned a little more than this; having shown the function of consistency within rational belief, we are able to see more clearly the nature of the problems raised by the two paradoxes. In the lottery case having arrived at inconsistent beliefs with no way shown to extract ourselves, we are entitled to be suspicious of the route by which we came, at the very least to say that probability inference cannot constitute a general theory of inference. However, if this is correct how are we to accommodate the problems raised by the preface paradox? For there, by supposition, we arrived at the inconsistency by employing reasoning justified by, simply, a general theory of inference. It would appear then that the rational man who organises his beliefs in accordance with the principle 'Be consistent' should not have any beliefs at all.

But before we draw this dismal conclusion, we should explore such alternatives as are presented to us. This we will do in the next chapter, where we will consider the solution offered us by Kyburg.

Appendix to Chapter Two.

Rather by an oversight I have, in fact, failed to do what I said I had done at the end of part (ii) of Chapter Two. That is, to justify each of the principles of commitment employed to reduce the two versions of Moore's paradoxical belief to cases of inconsistent beliefs. The principles I employed were, apart from (Conj):

(A) B(a)p entails C(a)B(a)p.

(B) B(a)B(a)p entails C(a)B(a)p.

the rather unfortunately named (C) (not to be confused with the criterion of consistency).

(C) B(a)p entails C(a)p.

(D) C(a)C(a)p entails C(a)p.

and, (E) C(a)B(a)p entails C(a)C(a)p.

Of these five principles four, (B) to (E) were justified in the discussion in which I showed that Moore's paradoxical beliefs were to be considered as inconsistent beliefs. However, (A), necessary in dealing with B(a)(p and not-B(a)p) case, I have not justified.

(A) is, of course, the most difficult to justify for, unlike all the other principles, it lacks any great immediate appeal. It is a particular case of another, quite fallacious, principle:

p entails C(a)p.

But clearly we will find no grounds for the justification of (a) here. The principle (A) does have, at least, two points in its favour. The first is that it does get rid of the B(a)p and not$B(a)p) case, and help preserve the criterion of consistency proposed in the chapter. The second is that the existence of such a principle would explain, but not justify, why some philosophers have wanted to argue for; B(a)p entails B(a)B(a)p.

To justify the second, the more important, of the above two claims would be out of place here but we can at least sketch a line of argument. Suppose an individual, A, utters the proposition p and does so under circumstances in which it would be appropriate to ascribe to him the belief that p: i.e. B(a)p. Now we would surely want to argue that if this were the case then B(a)B(a)p is also true. The problem is how do we guarantee this if we deny that B(a)p entails B(a)B(a)p? Well, we can begin to see how to get an answer to this if we accept that B(a)p entails C(a)B(a)p. And also show, as we have no time to do, that the conditions which turn mere utterences into beliefs also turn commitments into beliefs.

Why is one entitled to believe what one is committed to believe? And if one isn't, why not perfectly consistently entitled [illegible] of propositions believed?

Chapter Three.

Kyburg's Solution to the Lottery Paradox.

The lottery paradox begins with an application of the rule of detachment.

(D_H) Accept or reject h, given K, according as to c(h,K) is greater than $\frac{1}{2}$ or c(h,K) is less than $\frac{1}{2}$; when c(h,K) equals $\frac{1}{2}$, h may be accepted, rejected or left in suspense.

This, of course, is not a principle of commitment but a candidate rule of acceptance. It gives us the first step:

(1)'[a] The probability that q is N-1/N (greater than $\frac{1}{2}$) thus A may accept or come to believe q .

The move from the first step to the second, in which A is committed to believe of each participant that he will lose is demanded by the following principle of commitment.

(Neut)' If c(p,K) is greater than $\frac{1}{2}$ and A accepts or comes to believe p, then A is committed to believing q.

We may call this the principle. of neutrality. All we need now, to complete the list of principles, is the principle that demands the move from <u>A is committed to believing of each that they will lose</u> to <u>A is committed to believing that everyone will lose</u>, and this is as follows:[b]

(Conj) If B(a)p and B(a)q, then B(a)(p and q).

If C(a)B(a)p and C(a)B(a)q, then C(a)B(a)(p and q).

The preface paradox relies on exactly the same principle (Conj), but obviously not (Neut)', as such, since we have here stated it in terms of the rules of acceptance (DH). The more

(a) We will number the steps in the two paradoxes as in the first chapter.

(b) In fact, of course, there is an implicit use of (Imp) here as well. But since no-one has yet suggested that this principle be rejected I have not brought it into the discussion.

general principle of neutrality stated simply in terms of a general rule of acceptance will be:

> (Neut) If on the set of propositions A believes, PB(a), it is shown by some rule of rational acceptance, R, that A may accept p, then A is committed to believing p.

So now we have in front of us a complete description of each of the two paradoxes, each step and the principles and rules which demand each step. Before turning our attention to solutions that have been offered to the paradoxes which hinge on one or other principle of commitment, let us say something about principles of commitment. The most important point to be made about commitment is that it is not obligation. That is to say if 'A' is committed to believing p' then it does not follow that 'A ought to believe p'. There are a number of points that make this clear, but the most cogent is a point that follows from considering a man, A, who has inconsistent beliefs. It is not the case that if A believes both that p and that not-p then A ought to believe everything. And this is just a special case of the more general one: if A believes p and p entails q, then it does not follow that A ought to believe q. For the perfectly simple reason that it might be the case that A ought not to believe p. It is not even the case that if A ought to believe p then A ought to believe q, if p entails q. For, if an individual believes only what he ought to believe, then he ought to believe all the consequences of what he believes: this would be absurd. Although we have shown that A is committed to believing p does not entail that A ought to believe p this does not mean that there is no relationship between them at all. There is a relationship but it is more complex. That there is, is shown by the fact that if there was

[illegible]

not we could never force someone to a conclusion.

Let us now turn to considering the three possible solutions which are presented to us; keeping our attention fixed solely on the lottery paradox. The three alternatives are:-

(a) We can reject (D_H) as a rule of rational acceptance.

(b) We can reject (Neut)' as a principle of commitment.

(c) We can reject (Conj) as a principle of commitment.

The candidate solution (a) would solve the problem by denying that A could accept, or rationally come to believe q, simply because the probability that q was greater than some figure; in the case of (D_H) this will be $\frac{1}{2}$.

The candidate solution (b) would solve the problem in the following way. Suppose that there are ten people who take part in the lottery A,B,C, ...,J. It follows that the chances of B losing will be 9/10; similarly for A,....,J when their probability is estimated on B(a). Now A notices that the chances that B will lose are 9/10, so he accepts that A will lose. Now this gives A a set of beliefs different from B(a), since it will include the belief that A will lose. So A now estimates the chances of anyone losing on a different set of propositions. For example the chances that C will lose have become 8/9; but this again is greater than ½ so A accepts it. And so on down the line until there are just two people left. By this time, calculating on the beliefs that A has acquired, we have the chances that A will lose are $\frac{1}{2}$, and the chances that J will lose are $\frac{1}{2}$. A being malicious, or optimistic, accepts, rigidly adhering to (D_H), that J will lose, and discovers that he will win! In this way the set of beliefs that B acquires will not be inconsistent

B?

But there are many, uncountable, ways of conducting the argt.

since they will be that B will lose, C will lose, ..., J will lose, that someone will win and that that someone will be himself.

The candidate solution (c) will solve the problem. For accepting (C), as a criterion of consistency, it will simply point out that the move from 'A believes p and A believes not-p' to 'A is committed to believing p and not-p' is not justified; and hence A does not have inconsistent beliefs. Perhaps neither of the solutions looks inviting, but obviously we should investigate them. In this chapter we will examine candidate solution (b) and (c), and in the next chapter we will examine (a). No one has yet seriously proposed (b) as a solution to the lottery paradox, but (c) has received some support, most notably from Kyburg, who constructed the paradox in the first place.

Let us consider the (b) solution, it is probably clear that as a solution it lacks any interest at all. However, it does raise a number of important points. Consider the situation where ten people take part in a lottery. Leaving aside complications about the fairness of the lottery or of the technical hitches that might arise, there are ten mutually exclusive and exhaustive possibilities. They are that A will win, B will lose, C will lose, ... etc.; A will lose, B will win, C will lose, ..., etc.; and so on. The position we arrive at by rejecting (Neut), and doing no more about it, is that it is equally rational to accept any one of them; and that it is equally rational to accept any one of them although we have no reason to prefer one rather than another, and we know that only one alternative is the correct one. It is this extreme arbitrariness that makes (b) such a bad solution.

There is also another point. Although by adopting (b) we do avoid coming to contradictory beliefs; we come to have beliefs such that the antecedent probability of the conjunction of propositions believed is lower than our initial stipulation for rational acceptance. Now although this is not contradictory it does rather take away the intuitive plausibility that high probability has as sufficing for rational acceptance.

From these points we can see that the rejection of (Neut)' amounts to the following. The rule of acceptance (D_H) is supposed to be such that given an argument 'p hence q', if it has certain properties, then we may on the basis of p accept, believe, q. Thus a rule of rational acceptance is an analysis of what it is for p to be a good argument for q, sufficiently good for us to be able to accept the conclusion. So by rejecting (Neut)' we are saying: if this is a good argument for its conclusion, then it does not follow that we ~~may~~ need so consider all similar arguments to be good arguments for their respective conclusions. So we are implicitly rejecting (D_H) since we are denying that it constitutes an analysis of what it is for p to be a good argument for q.

So let us turn to the solution (c), advocated by Kyburg and others. In his article 'Conjunctivitis' Kyburg makes the following comments:

> It is difficult to give arguments against the conjunction principle partly because it is so obvious to me that it is false, and partly because it is obvious to others that it is true. The most persuasive arguments perhaps are those which stem from the last theorem presented; it seems preposterous to suppose that all of our

> inductive knowledge has to be embodiable in a single fat statement. It seems too limiting to say that I have to believe the conjunction of everything I have a right to believe (there cannot be very much, then, that I have a right to believe), and it seems even more unreasonable to claim I have a right to believe the conjunction of everything I have a right to believe. Although I claim to have good reasons for believing every statement I believe, I claim also to have good reasons for believing some of those statements are false. I think that both of these claims are perfectly sound; and if they are, the conjunction principle is false.[a]

But however obvious Kyburg professes to find the principle of conjunctivity, he rather gratuitously leads us to believe that its rejection does not come as second nature to him, for earlier in the article, he says:

> But there is obviously something inconsistent about accepting that an arbitrary p is not-R (Since it's a p and that's all we know about it), and accepting the statement that an arbitrary p is R (since it's a p and that's all we know about it).[b]

But if there is nothing at all inconsistent in believing p and in believing not-p at the same time, what could there be inconsistent about believing p because 1 and believing not-p because 1, at the same time? The support a set of beliefs has does not confer upon them, nor does it deprive them of, consistency. Such a situation as Kyburg describes could only seem odd to

(a) p.77 <u>Induction, Acceptance, and Rational Belief</u>. Ed.M.Swain (D. Reidel, Dordrecht, 1970).

(b) p. 60.

someone who already accepted the oddity of believing p and believing not-p at the same time.

The situation is as Kyburg describes; it is very difficult to argue for something that one finds obvious. Especially when those consequences that make one find it so obvious, are just those consequences that the other is prepared to deny. It is like having to convince someone that the fire is hot despite the fact that he has put his hand in it and denies having been burnt, although one can see the blisters. But mere rhetoric will not prove (c) a false option, nor will it convince Kyburg that it is; what we have to show is that the two reasons Kyburg gives for taking this alternative are not reasons that compel us to follow him, and that there are reasons that compel us not to follow him.

There are two quite obvious consequences that we must accept if we accept (c). One is the immunity from a priori criticism an individual will have if he believes p and believes not-p. The other is that we must reject any idea that consistency and inconsistency are concepts that can play any part in determining the rationality of sets of beliefs. It is worth while reminding ourselves of the counter-intuitivity of the first consequence. Consider an argument between two people A and B in the course of which A says that he believes all paintings done in a particular period were forgeries, and then later on says he believes of a particular painting of the same period that it is not a forgery. B charges A with contradicting himself, which A indignantly denies; B then charges A with changing his mind, which again A indignantly denies. We are to imagine, according to Kyburg, that A can alleviate B's, by now, acute intellectual discomfort, not to say disgust, by pointing out to him that he does not believe the conjunction of

Not square to the point.

'All paintings done in a particular period were forgeries' and 'This painting, of the same period, is not a forgery', but only that he believes each of them; and, of course, he is not thereby committed to believing their conjunction. Surely our sympathies in the dispute will remain with B. It would seem therefore that to accept the alternative presented by (c) is to reject the ordinarily accepted canons of rational dispute and amounts to declaring them incoherent.

That the second point is a consequence is shown by the fact that in order to get consistency to perform any function when applied to sets of beliefs, we need to have some means whereby we can relate one belief to another. By rejecting (Conj) Kyburg has effectively insulated each belief from all others. In other words, in order to extend the notion of consistency from consistency

Nearly right.

between propositions to consistency between beliefs, we need some way of breaking down their isolation. (Conj) does just that and it is difficult to see what could take its place if it were rejected.

The trouble with these points as objections, however, is that they are consequences Kyburg wants to accept, for he is hoping to maximise the number of types of possibly rational belief sets; he wants to be as liberal as he can. We are not going to convince Kyburg of the error of his ways by simply pointing out that those consequences that he wants or believes to be desirable do indeed follow from his position; we have got to show that the extremely liberal view he has of the authority of rationality amounts to its abdication.

One point that may be made is that in describing a theory of rationality it would seem reasonable that we should seek to maximise the possible sources of criticism of a belief, rather than minimising them as Kyburg would seem to be doing. Such a demand is for example implicit in Popper's contention that a good scientific hypothesis should be as vulnerable as possible (while yet consistent with the available evidence, that is).

Another perhaps more telling objection arises when we ask ourselves whether or not a man who believes p and who believes not-p could be said to know either of them; or, since this is a little ambiguous, could it be said of such a man that either belief constituted knowledge? To say of one of them that it does, would be like saying of a man who backs all the horses in a race that he knew that such-and-such a horse was going to be the winner. If such a claim was made we would be inclined to ask 'why then did he back all the others?' Of course, reasons could be given since one can back a horse for reasons other than those related to backing it to win, but if we ignore such possibilities the analogy becomes exact. Given such a situation we would say that backing all the horses in a race was a sure indication of ignorance rather than knowledge. Accepting that an individual who believes p and who believes not-p could not be said to believe either of them, we might ask what could be the point of having both beliefs. Well, it is not very difficult to think of advantages. Consider, for example, the use ~~of~~ a politician might be able to make of such a situation were he to find himself in it. What it is difficult to do is to see how such advantages relate to epistemic rationality. This is not to argue that Kyburg's thesis is no different from the thesis that we may believe what we like, but it is to suggest that it suffers from similar defects. To put the matter as succinctly as possible, we would not say of an individual who believed everything that he knew everything.

In order to evaluate this point we have to rejoin the argument begun earlier and then left - the argument which shows that Kyburg has to reject consistency as a desirable feature of rational sets of beliefs - and to relate it to the overall investigation in which we are engaged. In order to analyse the notion of rational inquiry we must specify a goal and means by which that goal ~~of re~~ is to be achieved. Let us suppose that G is the goal of rational inquiry and F the means by which we are to achieve it. Now, if Kyburg is right we have to suppose that the following is a possible situation. An individual can employ, or follow, means F and reach a position, P, such that he can know that in having arrived at P he has employed F quite correctly and can also know that in arriving at P he has not achieved G. Further, by refusing to take the demands of consistency seriously, Kyburg would have us believe that this situation need be neither unusual or odd. We can see that this is a situation Kyburg wants us to accept as possible by taking G to be knowledge, F to be (D_H), or some equivalent, and P to be believing that p and believing that not-p[a].

(a) It is worthwhile pointing out again that here as elsewhere in the thesis, nothing at all hangs on the use of believing p and and believing not-p; all uses could be eliminated without loss cogency, but not of brevity.

If we accept Kyburg's argument then the only way of avoiding the complications implied in the above argument would be to deny that the goal of rational belief was knowledge, or anything that demanded true belief, and this moveis, surely, absurd. But what are the complications that follow from the above argument? Kyburg attempts to show that if we make certain demands on rationality then we are led to view rationality as fatally flawed, because such demands lead to the lottery and preface paradoxes. However, the picture of rationality that Kyburg paints, as an alternative, is one in which we are supposed to view with equinamity the possibility of situations arising in which we can be aware of the fact that our reasoning has not achieved its aim and yet also be aware that we can do no better. What can this be but a fatal flaw? Even if we can provide no solution to the lottery and preface paradoxes all Kyburg seems to have succeeded in doing is, at best, to substitute one infirmity for another. And in order to effect the substitution he has rejected the claims of consistency and in so doing - quite apart from the counter-intuitivity of the suggestion - has made quite precarious the homogeneity of belief required to ascribe coherence to an individual.

At this point we can see that we have advanced sufficient reasons for not following Kyburg in accepting (C) as the solution to the lottery paradox. It might be felt that we have dealt a little insensitively with it, that Kyburg only needs to reject unrestricted use of (Conj) and is in a position to accept the restricted use of (Conj.). That is, use of (Conj) is restricted to within sets resulting from some partition of one's total set of beliefs; but apart from the difficulty about what such a partition could be and how it could be related to the concept of rationality, it is difficult to see how it's operation within such paritions would not give rise to similar paradoxes, for example the preface paradox.

It seems, therefore, that either we reject probability as the method of rational inquiry or we accept an extremely cancered view of human rationality. Let us explore the first alternative in the next chapter.

Chapter Four.

Epistemic Reasoning and a Rule of Detachment.

We have so far tried a number of possible ways of extracting ourselves from the consequences of the lottery paradox and failed to find them satisfactory, this seems to leave us with only two possible alternatives. We may either deny that the lottery paradox is a problem, and argue that situations of that sort were bound to arise for beings who had to resort to methods of non-deductive inference to acquire knowledge; or we may examine the claims that a rule of detachment for probability statements has to being a rule of rational acceptance. Quite clearly the first alternative is a counsel of despair, hardly an inviting solution, so let us turn our attention to the second alternative. But before we do that it is worth recapitulating what we have done up to now and delineating the strategy of the argument as it leads on from here.

Remembering that the object of the discussion is to show that the existence of the two paradoxes does not show the impossibility of rational belief; we have to show that either the derivation of the two paradoxes is faulty, or that there is an asymmetry between the lottery paradox and the preface paradox that enables us to draw different conclusions from the existence of the preface paradox than from the existence of the lottery paradox. In the second chapter we showed that both paradoxes led to beliefs that violated the principle 'Be consistent' and hence the principle 'Do not have false beliefs'. In the third chapter we failed to show that there was some step in either of the derivations of the paradoxical beliefs that was faulty in some way, and so could not show that, since the steps in each are largely the same, both paradoxes may be ignored.

This suggests that we must look elsewhere and examine steps (1) and (3) in the preface paradox and step (1)' in the lottery paradox.[a] But it is to be noticed that we cannot force an asymmetry between steps (1) and (3) and step (1)' based on the fact that step (1)' leads to a contradiction, since this is so in both cases. In other words, we cannot couch an objection to the lottery paradox in terms of its leading to contradictory beliefs sometimes, since this will be the case with any acceptance principle as is shown by the preface paradox. We simply cannot appeal to the principle 'Do not have false beliefs' to separate the two paradoxes. However, we must be careful not to interpret this as implying either the rejection of the principle 'Do not have false beliefs' or that we should take it lightly. If this principle is to be violated then it can only be under very special circumstances; what we have got to do is to show that these circumstances do obtain in the preface case but do not in the lottery case.

What we must do then is to examine the claims made by those who hold that there is a rule of detachment for statements of probability, and we must show that the view of rational inquiry that is held by such theorists is inadequate in some way. And we must do this on grounds independent from the lottery paradox.

Up until this point we have been fairly sloppy in talking about the probability of a statement's being true. So before we discuss the merits and demerits of taking some rule of

[a] We are retaining the numbering used in Chapter One.

detachment as a rule of acceptance, let us acquire some background knowledge about probability and its introduction into the debate on rational belief.

Part(i). Why a rule of detachment?

Many people have argued that somehow the concept of probability is the key to the problem of induction, and although it would be ridiculous to think that all have been led to this belief along the same route, it is not an over-simplification to say that there is sufficient similarity among the sort of problems these people have been impressed by, for us to describe a single line of thought that has led them to holding this position. So let us do just that.

The problems posed by non-deductive inferences, that is, inferences from premisses to conclusions not entailed by them, stem from a feature of them that is supposed to follow from this fact; namely, that it is not the case that we can invariably infer true conclusions from true premisses. Whereas in deductive inferences we can formulate a set of rules which, if followed correctly, give us a cast-iron guarantee that we will not infer a false conclusion from a true premiss, the same cannot be said of non-deductive inferences. Indeed the problem goes deeper than that for we do not have any such comparable sets of rules for non-deductive inferences as we do for deductive inferences. This gives us two problems of induction: the first is to provide the rules, if there be any, for inductive inference, adherence to which would justify a particular inductive inference; the second is to show that the employment of these rules is sufficient to grant rationality to those beliefs acquired through them. That is to say we must combat both a local and a general scepticism.

Consider the following inferences:

(a) From 'I seem to remember that I got the shopping.'

A infers 'I remember that I got the shopping.'

(b) From 'I seem to see a chair.'

A infers 'I see a chair.'

(c) From 'Always in the past whenever we have had lightning, it has been followed by thunder.'

A infers 'Thunder always follows lightning.'

(d) From 'John has been caught thieving again.'

and 'In all cases in the past when John has been caught thieving he has promised not to steal again.'

A infers 'John will promise not to steal again.'

Now taking these as examples of inferences made at a particular time, by a particular person, A, we can see of each of the cases (a) to (d) on the basis of a premiss or premisses A moves to a conclusion, the premisses being claimed to be good reasons for accepting the conclusions. So characterising induction as simply the process by which we move from a set of premisses to a conclusion not entailed by them, the problem becomes: how do we distinguish between A's good arguments, if any, and A's bad arguments, if any? And are A's good arguments good enough?

The fact of the matter is, however, that historically very little has been said about the justification of particular inferences, or in giving an answer to our first question; most discussions about induction have been directed at providing an answer to the second question, namely the justification of induction in general. Without going into a detailed description of the traditional debates on induction we can describe the sort of problems such debates got into; the sort of problems some feel can be avoided by the introduction of the concept of probability.

One move that has been advocated is the reduction of the scope of local scepticism by showing that large classes, and possibly all, are not inductive - or non-deductive we use the terms interchangeably - at all but disguised deductions or enthymemes. This programme, if it were possible to carry it through, would help because it would explain the problematic nature of inductive inference by showing that there was no such thing, all inference then being deductive; and it would clarify the nature of reasoning because, rightly or wrongly, the role of deductive inference in reasoning is felt to be understood.

An example of this sort of reduction can be given as follows. Consider the inference from a proposition about a particular to another proposition about the same particular, that is, from Fa to Ga. This inference it is suggested relies, if valid, upon some universal law $(x)(Fx \supset Gx)$[a] which in conjunction with the premiss entails the conclusion. Now perhaps many of the propositions that we come to believe are arrived at by deductive inference but clearly not all can be. In particular there must be, at least, some singular statements that we do not establish in deductive fashion. However, it is argued that we do have a set of statements not established by inference and belief in which is incorrigeable, such statements are first-person present-tense reports of observational states. But even supposing that such statements can provide a sufficiently rich evidential base, and it is clear that such an

(a) As is well-known there are a whole set of problems related to giving this as the logical form of a universal law. However, if it is possible to give support to such an analysis then the thesis we are considering gains plausibility; but, equally, if it is not possible to support such anx analysis then the thesis diminishes in plausibility. And there are certain features that cast justified doubt on such an analysis. There is the notorious problem of counterfactual conditionals. But also, the defeasibility of universal laws which is not reflected in such an analysis, and this feature of unversal laws would suggest that

continued over ...

an assumption is dubious, we still have to extend the programme to include inferences that establish universal laws.

Now discussions as to the nature of inferences to universal laws have usually devolved around such questions as 'Will the future be like the past?' or 'Can we assume that what has happened in the past will happen in the future?' Also such discussions have tended to assume that the inferences to be shown to be enthymemic are of the form:

Fa&Ga and Fb&Gb and ... Fi&Gi ... to $(x)(Fx \supset Gx)$.

It is clear how in general the argument will run. Assuming that the universe of discourse is events, some of which will have occurred and some of which are occurring and some of which will occur, we want to say that of any event a $Fa \supset Ga$. However, all we have to support this claim is a set of conjunctions Fb&Gb, Fc&Gc,... etc., which can at best be a small sub-set of the total set. Now given that what needs justifying in the inference, is the commitment to unexamined members we can see how the blanket assertion that the future will be like the past will help, by offering some hope that inferences of this sort are enthymemes as well. What needs to be done is to show that we can say of the premisses that they constitute a characterisation of what the past was like. This would go at least part of the way to showing that such inferences were indeed enthymemes.

Although it is clear how the argument will run in general, it is impentrably obscure as to how it will work out in detail, for the list of difficulties is almost endless. The most obvious difficulty comes when we consider how it is we are supposed to say of the small sub-class of past occurrences that have been examined that this is what the past was like without making an inductive inference. And even supposing that these and other problems are accommodated such that the inferences can be shown to be enthymemic this can only show that they are valid if the extra premiss 'The

(a) continued from previous page.

even if certain inferences did require universal laws there addition to such inferences would not be sufficient to turn them into deductive ones.

future will be like the past' is true; and how are we supposed to know this? If it is not a necessary truth then it would seem that we could only come to know it by inductively inferring it, and this would lead us back where we started from. So it would seem that this strategy demands that the statement 'The future will be like the past' must be construed as a necessary truth. The trouble with this is that such statements have an uncomfortable habit of appearing false (when interpreted in such a way as to make it seem likely that they could be used to transform universal generalisations into enthymemes), or so empty, if true, that it is difficult to see how such statements could be used to give any support to anything. Where the attempt to push such a programme through has not been so complete as the above, discussion about the rump left over of irreducibly inductive inferences has been in terms of combating global rather than local scepticism.

Although to a certain extent the previous few pages are a caricature of the traditional debate on the justification of induction, it is not so unfair as all that; and it shows us not only why many felt that the introduction of the notion of probability into the debate would bring some enlightenment, but also those particular features of probability that were felt to be so attractive. In order to appreciate this more fully let us consider the following argument.

(a) Menthol cigarettes were found under John's bed.

(b) John is the only person in the house who smokes menthol cigarettes.

so, (c) John put them there.

Let us suppose that the inference is a good one and that (c) is true. And let us suppose the same argument is employed on another occasion except that 'Wednesday' replaces 'Tuesday' and on this second occasion the conclusion is false, because Fred put them there trying to incriminate John. Now we do not want to argue that the first use of the argument is invalid because the second use failed to produce a true conclusion. That is, the true in all possible worlds characterisation of the validity of deductive arguments will not do for inductive arguments. So, the argument runs, we must look for some relation R that holds between (a), (b) and (c), in the two cases described independently of the truth-value of (c). The obvious candidate is probability i.e. '(c) is probable to such-and-such a degree on (a) and and (b)'.

This suggests that the argument above should be recast as follows:

(a) Menthol cigarettes were found under John's bed.

(b) John is the only person in the house who smokes menthol cigarettes.

So, (c)' Probably John put them there.

So, (c) John put them there.

Now it can plausibly be argued that the relation '- is probable on -' is a logical one; and, further, on a consideration of arguments like the following:

(i) Fido is a dog.

(ii) Most dogs dislike cat-food.

So, (iii) Probably Fido dislikes cat-food.

it can be argued that since we can quantify expressions like (ii) we can also quantify expressions like (iii).

(b) John is the only person in the house who smokes menthol cigarettes.

So, (c)' Probably John put them there.

So, (c) John put them there.

For this to be of help we need to be able to show that the step from (a) and (b) to (c)' is deductive. Since it is already clear that the relationship '(c)' is probable on (a) and (b)' is not affected by the truth or falsity of (c)'. Now on consideration of arguments like the following:

(i) Fido is a dog.

(ii) Most dogs dislike cat-food.

So,(iii) Probably Fido dislikes catz-food.

it can be plausibly argued that the relation '- is probable on-' is a logical one. Since we can quantify expresses like (ii) we can also quantify expressions like (iii). Therefore, we can quantify the degree of support, degree of probability, the evidence confers upon a particular statement. And this in turn suggests that we can evaluate such moves as from (c) to (c)' in terms of the degree of probability of (c). That is if the degree is high, we may infer (c)', otherwise not; in other words, employ a rule of detachment. This proposed solution is a solution to the problem of local scepticism, the problem of general scepticism, that is justification of the use of a rule of detachment, is not touched by this proposal.

Vice-versa

This is not detachment

At this point it becomes rather difficult to give a short description of the development of the introduction of probability into the debate, since clearly any description of probability must include details of how we are to assign particular values to particular statements, and it is just that that is most contentious in probability theory. In the next part we will go on to indicate the sort of difficulties that face probability theories of induction, in trying to give an account of the assignment of such values that could plausibly be considered an analysis of 'p makes q, so-and-so probable', and, at the same stroke, a plausible account of 'p is a good argument for q'.

<u>Part (ii) Why not a rule of detachment.</u>

One problem that confronts those who advocate a central role for probability in illuminating the problems of induction may be illustrated by the following example:

(1) Liverpool have only once in one hundred and fifty meetings defeated Chelsea when Chelsea have worn green shorts.

(2) For the match, on Saturday, against Liverpool, Chelsea will wear green shorts.

So, (3) Most probably Chelsea will win.

So, (4) Chelsea will win.

Now ordinarily, I would suggest, we would consider that such deathless pieces of information as those in (1) and (2) were of, at most, slight relevance to a rational estimation of the chances of either team in the encounter; and even less relevant to a decision as to the outcome. However, it seems difficult to see how (1) and (2) could be made irrelevant to (3), on accounts of <u>probability</u> that take argument ~~of~~ the form of the argument (i), (ii) hence (iii) given in the previous section to be paradigmatic. This suggests strongly that a straightforward account of probability is not directly related to the worth of an argument. We need to introduce some notion of relevance such that the above argument fails to be a good argument for (3). But it is not obvious how such a notion could be brought in. It seems fairly obvious that, at least sometimes, whether or not p is evidence for q is a

Now the discu[illegible]
[illegible] turned to a
[illegible] the dis[illegible] of
[illegible]iti-rule.

contingent matter, and, therefore, if we include a stipulation of relevance in the assessment of the probability of q and p then the probability relation ceases to be a logical one; and we are landed back with our original induction problem.

A further problem that exists may be illustrated by the following two examples:

(A) John is a dog.

(B) Most dogs like Felix.

So, (C) Probably John will like Felix.

And

(A)' John is a Boxer dog.

(B)' Most Boxers do not like Felix.

So, (C)' Probably, John will not like Felix.

Now let us suppose that some individual, X, believes both (A) and (B) and (A)' and (B)' and wants to know whether or not John will like Felix. By assumption the relation between (A), (B) and (C) and between (A)', (B)' and (C)' is a logical one. So it is difficult to see why John should prefer the second argument to the first, or vice versa, and draw his conclusion accordingly, since we are to suppose that high probability is sufficient to justify acceptance, and high probability there is in each case. Clearly we do not want to allow X to accept either according to his whim, nor do we want him to accept both.

It might be supposed that quandries such as this were easily resolved by adopting some such principle as Hempel gives as his third requirement.

C.R.3: The inferential acceptance of any statement h into K is decided upon by reference to the total system K.

But the matter is rather more serious than this for if we adopt the proposed solution then it would seem that according to the probabilist we can never rationally change our minds. This may be shown quite simply. We can only change our minds if having accepted a proposition p we later accept evidence q such that q shows p to be doubtful or false. However, if we stipulate that we can only accept a proposition q by evaluating its probability on the basis of all the propositions we have accepted, then since we will evaluate q in part on the basis of p; we can, it seems, never accept a proposition that would show that some other we had accepted should be rejected. In other words, if q is substantial evidence against p, a proposition we have already accepted, then since according to C.R. 3 we must always evaluate it probability upon p we must always reject it. Neither can we alter C.R.3. by the qualifying clause 'by reference to the relevant propositions in the total system K', since we must include in the set of relevant propositions the proposition p and q is good evidence against.

But is this so?

It would seem that the only way out of this problem is to divide the beliefs we have into two kinds, say, (L)-type and (M)-type, such that we always accept (M)-type statements on the basis of (L)-type, or on (M)-type statements, and we accept (L)-type statements on some other basis. Given such a structure we can see how it is possible to reject (M)-type statements. For example, after we had accepted some (M)-type statement we are later led to accept certain (L)-type statements such that would demand the rejection of the previously accepted

(M)- type statement. The trouble with this sort of solution is that unless (L)-type statements are incorrigable, in the sense that we cannot rationally change our minds about them at any time after we have accepted them, we are led to a vast hierarchy of types of statements, namely evidential types, of a sort that does not seem at all plausible. And there certainly does not seem to be any type of statement that is incorrigable in this sense. It is to be pointed out that this argument, although similar, is substantially different to the argument employed by A.J.Ayer in his article Two Notes on Probability[a]; this argument we will expound later for it points to that aspect of the two paradoxes that separates them.

The problems we have outlined here are by no means the only ones that can be pointed to; for example, there is the problem of assigning probability values to universal statements. But this and other problems are notorious and so we will not repeat them.

Although the problems outlined so fare are by no means inconsiderable problems for the probabilist, it is not at all clear that they constitute insuperable difficulties, nor is it clear that we can turn them into insuperable difficulties. If we are to find insuperable problems to put in the path of the probabilist then we must find them in thosevery theses that probabilists are themselves most sure of, rather than in those areas that they themselves find problematic. So let us turn to another point of attack.

[a] The Concept of a Person and other essays, A.J. Ayer, (Macmillan 1964).

The probabilists' main contention may be formulated as follows: p is a good argument[a] for q, or q may be rationally inferred from p if, and only if, there exists a certain probability relation between p and q. That is to say, it is necessary and sufficient condition for the rational acceptance of q, on the basis of p, that there is some probability relation between them. We will remain vague for the moment about what the relation is to be, because there is no agreement amongst probabilists as to what the relation should be; that is, whether it is high probability, and if so, how high, or whether it is something else like high probability relative to other alternatives.

Now, it might seem that the characterisation given above could only apply to at most a very few philosophers, e.g. Reichenbach, and to a most unpopular thesis, for probability functions have, in the minds of many, been replaced by confirmation functions, p (h,e) has been replaced by c(h,e). However, this replacement represents less of a shift than might at first seem. There has always been a great deal of doubt as to what the interpretation of the classical calculus at probability should be; the ratio of the favourable to the equally possible cases, or the numerical frequency of the distribution of some property amongst the members of some class, and so on. Carnap, Hempel and others wish to separate this analysis of probability, or rather to separate the sense of 'probability' that these rival interpretations seek to explicate, from another sense of 'probability' which will

No.

[a] Throughout the rest of the chapter we will use 'argument' which is perhaps not the most felicitous choice of words for the relation we are examining, but, in fact, nothing very important hangs on our choice of words here.

be an analysis of the meaning of 'degree of confirmation'. What is at issue here is how we assign numerical values to c(h,e).

What enables me to lump both the earlier and the later approaches to-gether under the heading Probabilist is that despite the disagreement as to how we assign values to confirmation functions, the structure of the calculus that shows the logical compatibility or otherwise of various numerical assignments to particular confirmation statements, i.e. c(h,e) is w, is given by the classical calculus of probability. Thus we have a situation in which the sense or senses, of 'probability' are disputed, and the sense of 'probability' relevant to inductive worth is also disputed, but it is agreed that the formal structure of the relations between statements of either probability, or confirmation, is given by the classical calculus at probability. of

For example, in classical probability we get the following as theorem, or as an axiom:

p(not-h,E) equals 1 - p(h,E), the so-called negation axiom.

We also get the same axiom in confirmation theory:

c(not-h,E) equals 1 - c(h,E).

Which is to say that a degree of confirmation of not-h equals one minus the degree of confirmation of h.

Because the semantics of confirmation calculus, as conceived by Carnap, Hempel and others, is not something they are agreed upon, it is difficult to attack an account such as they would give of 'p is a good argument for q', by pointing to problematic examples and so on. For this gives us no guarantee that such problems as are posed by such examples cannot be overcome by some alteration in the semantic interpretation of the supposed confirmation calculus. Thus it is possible that the problems, or difficulties, that we suggested earlier may very well be eliminated by some such move. If we are to set substantial problems for the approach supported by Carnap. etc., we must show that the syntax of confirmation statement, upon which they are agreed, cannot accommodate certain features that are necessary for an adequate analysis of 'p is a good argument for q'.

There are two features of the syntax of 'p is a good argument for q' that we shall claim cannot be accommodated by probabilists. They are, firstly, that if *p* is a good argument for *q*, and *r* is a good argument for *s* then *p and r* together constitute a good argument for *q and s*; and secondly, that if *p* is a good argument for *q*, then, also, *p* is a good argument against *not-q*. The first point is quite simple; it is just that if an individual, A, has an argument *p* for *q* andan argument *r* for *s*, and both are good ones, then he has not got to do anything more to establish *q and s*. than simply to present his argument *p and r*. The second point is equally simple. It is sufficient grounds for the rational rejection of *not-q* that an individual present an argument, *p* for *q*; we do not demand that in accepting *q* an individual present two arguments, one for *q* the other against *not-q*.

But the args under discn do *not* establish.

At this point we need to say a little more about the sort of probability relation that can be seen to justify rational inference from p to q. Hempel's suggestion is as follows:

(A) We may accept q given p if and only if c(q,p) is greater than $\frac{1}{2}$, and

We may reject q given p if and only if c(q,p) is less than $\frac{1}{2}$.

However, it would seem that we can give a number of reasons for rejecting such a rule as it stands; for consider a situation in which c(q,p) equals 0.51. Now if we are to suppose degree of confirmation a measure of the worth of an argument then 0.51 would appear too little superior to 0.49 to warrant acceptance of p and rejection of not p. So let us take a more plausible rule of detachment as follows:

(A') Accept q given p if and only if c(q,p) is greater than or equal to 0.8.

and Reject q given p if and only if c(q,p) is less than or equal to 0.2.

To [illegible] [illegible] args. [illegible] confirm args. against detachment with args. against calculation.

One point that may be made quite by the way about all these rules is the arbitrary nature of the fixing of the exact point at which acceptance is rational; a point so important we may consider that it should be marked by something other than some arbitrary fiat, and the fact that it is not something of a criticism in itself.

Now let us consider two propositions, l and m, of which the following is true:

(i) c(l,e) equals 0.8.

(ii) c(m,e) equals 0.8.

(iii) c(l,e and m) equals 0.8.

Where l is an individual's total body of evidence.

evidence. e?

Condition (iii) guarantees that l and m are stochastically independent.

No, it doesn't. with respect to e.

We may now ask the question whether l and m may be accepted by this person? To which we calculate c(l and m,e) and find that c(l and m,e) equals 0.64. by the multiplication axiom. So according to rule (A') this person may neither accept nor reject the conjunction, l and m. It would seem, therefore, that the multiplication axiom guarantees that in general if p is a good argument for q, and if r is a good argument for s then p and r will not be a good argument for q and s.

However, it might be objected, if q is an element of PB(a) and s is an element of PB(a) then A may accept q and s. But this only makes matters worse rather than better, for this is to raise the principle of conjunctivity to the status of a rule of acceptance from that of being a principle of commitment. Quite apart from the problems stirred up by raising principles of commitment to the status of rules of acceptance, what we now have is a situation in which we have two rules of acceptance, one saying one thing the other saying another. But it might be felt that this could be easily overcome by the following ruling: logical rules of acceptance i.e., the laws of logic interpreted as rules of acceptance, take precedence over rules like (A'). But this would be just hopeless, for this would make it logically impossible to rationally change one's mind.

It would seem therefore that the probabilists must accept the first of our two asymmetries. Now let us consider a second example in which the following is the case:

(i) A knows that (r or s or t) because (r or s or t) is a necessary truth.

(ii) r,s,t are logically mutually exclusive.

(iii) c(r,e) equals 0.70.

(iv) c(s,e) equals 0.15.

(v) c(t,e) equals 0 .15.

But doesn't this show that the premises probability are incorrect?

Thus a ccording to (A') A may reject s and may reject t, but may not accept r. However, not-r is equivalent to, in this case (s or t), so it would seem that a good argument against not-r is not a good argument for r.

The probabilist might object that this was bound to be the case since c(s or t,e) is greater than c(s,e) or c(t,e). But this would seem to constitute a further difficulty rather than a rebuttal, since it suggests that a good argument against s and a good argument against t does not constitute sufficient grounds for rejecting (s or t). It is to be pointed out that the above example is not to be seen as a disguised version of the lottery paradox, for no actual inconsistency is involved in the acquired set of beliefs.

However, the probabilist might argue that rules as inflexible as (A) and (A') were bound to lead to difficulties and that we should adopt some more flexible rule (A'').

(A'') We may accept q given p if and only if c(p,q) is much greater than the other alternatives, and we may reject p given q if and only if c(p,q) is much less than the other alternatives. But again this leads to similar difficulties. Consider.

c(p,e) equals 0.40.
c(q,e) equals 0.10.
c(r,e) equals 0.10

⋮

c(v,e) equals 0.10
c(p or q or r or ... or v) equals 1.0

But this is the lottery paradox.

Now in this example we can according to (A'') accept p, but what to do with not-p whose probability is higher than p?

No. I [illegible] [illegible] + I. gone beyond the calculus.

We may take it then that we are going to find systematic asymmetries between the syntax of the probability calculus and the syntax of the evaluation of non-deductive arguments in ordinary language.

However, what conclusions can be drawn from this? What the asymmetries show is that the probabilist account of the justification of particular inferences cannot be given as an analysis of what we ordinarily take to justify particular inferences. Furthermore, unless we have considerable grounds for rejecting what we ordinarily take to justify non-deductive arguments as incoherent (and we have not), we have no reason for supplanting what we have with the elaborate structure proposed by Carnap et al. with all its obscurities and complications.

What is this?

This does not mean that probability, or high probability does not play an important part in inferential reasoning, but only that it does not have the role that they would have us believe. This gives us sufficient grounds for rejecting the first step in the lottery paradox and hence avoiding further complications.

Before we leave <u>probability</u> let us have a look at the point Ayer makes in his article which we referred to earlier. The point can best be explained by using the same example

(A) John is a dog.

(B) Most dogs like Felix.

So, (C) Probably, John will like Felix.

So, (D) John will like Felix.

Now, suppose an individual, A, who has a dog, John, wants to know whether it will like Felix. Further, let us suppose that he knows (A) and he knows (B). So on the basis of (A) and (B), A, may work out a determinate value for the probability of 'John will like Felix'. Now the question Ayer prompts us to ask is: 'Why on the basis of (A) and (B) alone should, A decide whether or not to accept (D)?' That is, no matter what the value John discovers for the probability of (D) on (A) and (B), why should he stop his investigation? A has no reason to suppose that (A) and (B) exhausts possible relevant information. He has no reason to suppose that if he went on looking, or in this case started to look, he would not find evidence that would give a different value. For example, he might discover (A)' and (B)', that is that:

(A') John is a Boxer dog.

(B') Most Boxer dogs do not like Felix.

And if he did discover this then the value he would get for the probability of (D) would be totally different. There is no reason to suppose that the difference might be such as to make it rational to accept (D) in the one instance and rational to reject (D) in the other instance; at least, according to (D_H). There is no question of one value being the correct value and another value being incorrect. As Ayer points out the relationship between the premisses and conclusion is in each case a logical one and in each case the inference is perfectly correct, barring miscalculations, so it cannot be in these terms that the one is to be preferred to the other, if it is to be preferred at all.

In our earlier discussion we were concerned to demonstrate that in certain cases the probabilist has difficulty in showing that a determinate value for the probability of a statement can be arrived at, without at the same time ensuring that we could not rationally change our minds. The point here is, granted we can reach a determinate value, then why should we act on it? That is, why employ (D_H), or something similar, on our first value for the proposition? Or, our second, or any other?

To this it is tempting for the probabilist to make the following sort of reply. It is quite true that the more evidence we collect the better a guide probability is to the truth of a proposition but we cannot go on collecting evidence, we must stop somewhere. But if this is a tempting reply it is also quite misguided. For the whole point is that the probabilist has, and can make, no room for remarks like 'the more evidence we collect the better a guide probability is to the truth of a proposition' (even supposing that it is true, which it is not). For this would give us a two-tier structure of evaluation, the lower which would be a statement of the probability of a statement, and the higher which would be an evaluation of the worth of the probability as a guide to the truth of the statement. Now, if this higher tier is probabilistic, then we are led to a viscious intimate regress, and, if not, then the probabilist thesis lies in ruins.

Yes.

Now it is difficult to see exactly what this argument proves and Ayer himself does not develop it, but it is obvious that if we could discover what it was that rules like (D_H) were lacking that they should be led this sort of dance, a considerable distance would have been made towards discovering what soundness in non-deductive argument consists of. What it is not difficult to see is that probabilist answers to this question leave a great deal to be desired.

Chapter Five.

The Preface Paradox.

So far we have concentrated our attentions entirely on the lottery paradox, and it is not obvious how such conclusions as we have reached about that help us to reach a conclusion aboutnthe preface paradox. There is no doubt that one 'solution' is simply to deny the possibility of rational belief. However, although this is one course we can take this does not mean that we must take it; obviously we do not have to take any option available to us. But, at the moment, we have yet to show that there are any alternative options, and before we can do this we must fill in, to some extent, the rather sparse picture we have so far obtained of the evaluation of epistemic reasoning.

Up until this point all we have accepted is that an important feature of rational epistemic reasoning is adherence to the principle 'Do not have false beliefs'; recognising that this entails adherence to the principle 'Be consistent'. But it is quite clear that this cannot be the only principle we demand adherence to. For, if it were, it would be as rational for God to have no beliefs as for him to have beliefs, and this despite the fact that if God has a belief then it cannot be false. In other words, if the above were our only principle then, the preface paradox and other complications notwithstanding, it would still be the case that it would be rational to have no beliefs, whatever one's capacity for reasoning or one's access to evidence. And this we may take to be strongly counter-intuitive.

It seems, therefore, that before we can even begin to show that it is possible to have a rational set of beliefs, other than the null set, we must look for some additional principle of epistemic reasoning. A second principle has been proposed by Isaac Levi in his book <u>Gambling with Truth</u>, and that is 'Relieve doubt'. Such a principle is implicit, or not very far from the surface, in Kuhn's characterisation of scientific inquiry as a puzzle-solving activity, and in Popper's contention that scientists ought to make bold, rather than timid, conjectures. It would also appear to be the historical descendent of the 'will to believe' that William James wanted to ascribe to human beings.

What has this to do with rationality? [illegible] alleviate doubt by going to the church. C.S. Peirce on stabilising of belief. But perhaps it is a necessary condition only.

Levi's principle may be explicated as follows. An individual doubts p if he neither believes that p nor believes that not-p. Furthermore, we place a value on not being in such situations, quite independent of the truth-value of the proposition that we come to believe in order to alleviate the doubt. That is to say, coming to believe p has a value independent of the truth-value of p. However, rather than develop a second principle out of a criticism of Levi's principle, let us state another principle, in essentials no different from Levi's, but rather more generally applicable than his, more general in so far as it covers situations not obviously covered by Levi's principle. For example, in some situations, as when we ask the question 'Are squares four-sided?', we have two answers, 'They are' and 'They are not', where each of the possible answers is the negation of the other. Such situations are covered by Levi's principle, but investigations attempting to answer such questions as 'What caused the fire?' are less easily characterised as attempts to decide whether p or not-p. So

Surely he need to wonder whether p, too?

& which is

Yes

it is not easy to see how Levi's principle is going to function as a basis for criticising any piece of reasoning. It is not even the case that if p is a possible answer to a question then not-p is also a possible answer to the question. We can make Levi's principle more general by giving a different characterisation of doubt. Thus we retain the slogan 'Alleviate doubt' or 'Relieve doubt' but give it a slightly different explication.[a] An individual, A, has a doubt s, if he has not got an answer to a question Q_s. In order to avoid confusion, or the feeling that something philosophically contentious has been said, let us say a little more about this. The first point is that it is quite obvious that a question may have more than one answer; if this were not the case then we would have no basis for the distinction between correct and incorrect answers. The second point to be made is that this principle makes no demands that the answer should be the correct one, the other principle 'Do not have false beliefs' does that. The first point shows that there is nothing logically wrong with the formulation of the principle, and the second shows that the principle is not obviously wrong. A further point to be made is that the principle does not demand that a choice be made between two correct answers. Thus suppose a question has more than one correct answer then the principle does not demand that a choice be made between them; if p is an answer and q is an answer then 'p and q' is an answer. Lastly, to have come to the conclusion (p or q) - where p is an answer and q is an answer - is not to have come to an answer, it is, at best, to have narrowed the selection

[a] It is to be noted that both Levi's principle and our own employ a slightly ersatz notion of doubt, but this need be no source of anxiety.

from which the answer is to be chosen. It may be a better conclusion to come to than 'p or q or r', it may even be a better conclusion to come to than either p or q, but this still does not make it an answer to the question. Although the formulation of criteria by which we judge some statement to be an answer, and of criteria by which we judge 'p or q' to be closer an answer than 'p or q or r' - that is closer to an answer but not an answer - may be a difficult philosophical problem, we may take it that what we have said is not philosophically contentious, that is, there are such criteria. So the principle says replace doubt with an answer.

Later on we will explicate the principle in greater detail, but at the moment we need to answer some more pressing questions. We need to do more than point to a number of distinguished advocates of such a principle to substantiate the claim that we actually employ such a principle. We have to show that the principle does not conflict with our most general intuitions about rationality. We also have to show that such a principle does, in fact, have some work to do. And lastly, we have to show that adopting the principle is not simply an _ad hoc_ measure designed to get us out of difficulties - in ways we have not yet revealed.

We conceded earlier that rationality makes no completeness demand. That is to say, we do not demand of an individual that he believe all true statements, or again an individual is not open to criticism solely on the grounds that he fails to believe some true statements; therefore we do not want to couch our principles in such a fashion as makes such criticism possible. It was in recognition of this fact that we adopted the principle 'Do not have false beliefs' rather than the principle 'Have true beliefs'. However, if we are to avoid making such criticism possible we must reject principles of the sort we have just suggested; since we must allow, and the principle does not, that there by some questions, an immense number of questions, that an individual need not even attempt to provide an answer to. Thus, on the face of it, it does seem that the second principle that we have suggested does make a completeness demand and is thereby open to obvious and crushing criticism. So before we set ourselves the taks of showing that such a principle has some work to do, etc., we need find some reply to this sort of criticism.

The first escape route we have to explore is to be found in some thesis about the relationship between <u>ought</u> and <u>can</u> and in such general facts as the fact that it is quite impossible for a human being to resolve all possible questions. As Suppes points out:

> A theory of rationality that does not take into account specific human powers and limitations of attention, memory and conceptualisation may have interesting things to say, but not about human rationality.[a]

There is no doubt that considerations of this sort will demand a, perhaps, complex theory or account of the use of epistemic principles in criticism and assessment. However, it is not at all clear that considerations of this sort, giving rise to modifications, such as, 'Do yourbest to alleviate doubt', are going to provide an adequate solution to our p roblem. There are two reasons for thinking this. The first reason is that qualifying clauses of this sort provide difficulties elsewhere. There is obviously some point at which we would want to say of someone that they were irrational, that is

(a) Suppes, 'Rational changes of Belief', in The problem of <u>Induction Logic</u>(ed. by I.Lahatos), Amsterdam 1968, p.186.

epistemically irrational; the pattern of their 'reasoning' was such that we should not want to ascribe them rational beliefs at all. The obvious way of determining at what point this stage is reached is that point at which we could not say their 'reasoning' exhibited adherence to the principles of epistemic reasoning. In other words, we might simply want to say that some people's best was not good enough. But how can we do this when we add qualifications of the above sort to the principles by which we evaluate his reasoning?

The second reason is that even as it stands the principle is still open to criticism of a similar sort. Thus although it blocks an avenue to criticism of the sort 'A is a question to which you have not provided an answer, you have therefore failed to alleviate doubt'; in other words, criticism based on a straight completeness requirement. It fails to block another equally absurd route to criticism. This runs as follows: 'A is a question you can provide an answer to and you have not. You have thereby failed to do the best you can to alleviate doubt.' Now it clearly is not the case that we criticise people for failing to use their full intellectual powers all the time. That is to say it is not true that people ought to answer all the questions they can. If we do criticise people for not having answers to questions it is for more complex reasons than simply the fact that they could have an answer to the question if they investigated. 'You ought to have found out' simply does not extend to all the things an individual could have found out.

We need, therefore, some means whereby we can show that an individual's belief-acquiring activities can be both limited and rational. We have already shown that this cannot be done in terms of the truth-value of the answers to be discovered, since this still leaves us with too many answers to be found. Further, we have no reason to suppose such a delimitation could possibly be carried out in terms of subject-matter; for on the one hand this would be insufficient, and on the other not severe enough. It would seem that all we had to carry out this limitation are the personal characteristics of the investigator. We could use these by investing our concept of doubt with some more specific feature like '... is worred by ...'. Thus our explication of the concept of doubt would have become something like the following:

A doubts if and only if (i) He does not have an answer to a question.
and (ii) He is worred by that question.

This addition would have the additional, but not crucial, advantage of bringing our concept of doubt closer to the ordinary notion. But, however, helpful such an addition might be, ~~if~~ it has consequences that vitiate the suggestion. For the above demands as an analytic consequence of an individual having a rational belief in p that he was at some time prior worried by some question to which p was the answer. And this seems an improbable consequence to have to swallow. For example, if we are to admit epistemically rational beliefs at all then surely a paradigm example would be the belief that most men have that they are men; but are we to suppose that this is something that has at some time worried most men!

We seem to have reached a point where we have nothing left to help us salvage our second principle, unless we can show that our initial criticism was somehow misplaced. In order to find out whether or not this is indeed the case we need to examine the role that such principles play; whether they are the basis for evaluating reasoning in general, or whether they are the basis for evaluating particular pieces, or episodes, of reasoning, or whether they are a basis for evaluating the total sets of beliefs an individual has acquired, or what. Now we may not be clear that all these are totally independent, indeed we may take it that they are not, but it is clear that they are all different. Depending which role we take to be the primary one for our principles, we will get different answers to the question 'Do the principles we have proposed make a completeness demand?'

Thus if we take epistemic principle to be primarily concerned in the evaluation of reasoning in general, then it is quite clear that the second principle does make a completeness demand. Again, if we take them to be primarily concerned in the evaluation of the set of beliefs an individual has acquired then we get a completeness demand. However, this is not the case if we can show that the primary role of epistemic principles is to evaluate episodes of reasoning, the pieces of reasoning that lead up to the acquisition of a particular belief, or particular inquiries. That this is so is easily seen. Let us consider the sum total of an individual's reasonings, what we referred to earlier as 'reasoning in general'. If we make the demand that it should have alleviated doubt, or have gone very far in that direction, the demands of the principle has not been met. Similarly if we consider the total set of an individual's beliefs. However, as we shall show later on neither of these can constitute the primary application of the principles we are considering.

Let us consider a piece of reasoning, an argument, or, as seems much more appropriate, an investigation. There are at least two aspects of an investigation that are open to evaluation. The first is the instigation of the investigation, or the decision to make the inquiry, and the second is the course of the investigation or the worth of the reasoning carried out. Considerations relevant to the first evaluation are not relevant to the second. For example, if we want to determine the value of instigating some inquiry we may have to bring in considerations of economics, aesthetics, interest on the part of the investigator-to-be, his intelligence, duration of the investigation, effects on other people and so on. All this, and more, may be relevant to the first question, but they are certainly not to the second, as we pointed out in the first chapter. The results of the two evaluations are also entirely independent. An investigation the instigation of which was completely foolish, or absurd, may perfectly well result in a rational belief. Equally an investigation that it was eminently rational to begin may result in the acquisition of an irrational belief. Consider a man who is counting the number of leaves on a tree. Although we can imagine circumstances which would redeem such an activity, the result of a £1,000,000 bet might depend on it, let us suppose that no such redeeming features are present. Now we might well think that such an investigation was pointless or absurd, in so far as it is difficult to see why anyone should want to instigate such an investigation, but this does not mean that the individual would not come up with, or rather, arrive at a perfectly rational belief. Equally well it may be most important for someone to come to a conclusion about some question, and yet reason stupidly and so come to an irrational belief.

Given this distinction we can see that a completeness demand amounts to the demand that all possible investigations be instigated and that they should be completed by an individual. And in order to show that such a demand was a rational one, we would have to show two things. First that it was rational to demand that all possible investigations be instigated, and secondly that it was rational to demand that if an investigation be instigated then it ought to be completed. Now the two principles we have proposed could only entail a completeness requirement if we accepted that what was appropriate to establishing the first was also appropriate to establishing the second. In other words, if we were prepared to conflate the two modes of evaluation. But we have just shown that this would be a gross confusion.

It follows from what we have just said that the two epistemic principles we are offering 'Do not have false beliefs' and 'Alleviate doubt' do not make completeness demands ~~; and therefore,~~ because they must find their primary application in the evaluation of particular pieces of reasoning, and only secondarily in the evaluation of reasoning in general, or to the total set of an individual's beliefs.

But not all questions will arise in a particular investigation shall be investigated.

Before we move on we need to show that we have not proved more than we wanted. It might be suggested that we have atomised the evaluation of belief and in so doing have jeopardised the principle 'Be consistent', which only has any force if we can evaluate sets of beliefs as well as individual beliefs.

In fact it can be shown quite easily that this is not a consequence. The problem arises as follows, since the epistemic rationality of a set of beliefs is dependent upon the epistemic rationality of each belief, rather than the other way round, we seem to have jeopardised supposed features of rationality unless we can show that they can be exhibited in particular beliefs; and particular beliefs need not be inconsistent, yet the belief set in which it occurs may be inconsistent. However, even when only applied to particular investigations the principle 'Do not have false beliefs' is quite sufficient to generate the principle that we 'Be consistent'. For the simple reason that it still follows from the fact that belief in p and belief in not-p demands that one belief be

only those in the conduct of the investigation.

false. The cohesive force is supplied by matters of logic and the demand 'Do not have false beliefs'.

We may now turn from defending the principle 'Alleviate doubt' to the more important task of showing that such a principle has work to do, and to showing that such a principle figures in the solution to the preface paradox. But just before we do that we should complete the exegetical task we stopped half way through earlier on. At that point we cleared up a number of points relating to the notions of a doubt and of an answer that we employed, but we said nothing about the notion of an investigation that we have employed. Manifestly, if we are to give an account of <u>rational belief</u> then it cannot be such as to exclude sets of perfectly ordinary beliefs, such as beliefs acquired by seeing, hearing, and so on. Beliefs such as these, acquired passively, could hardly be said to have been acquired by inquiry or investigation, this implies something more active. Although this is certainly true it is something we will have to live with and we will have to acknowledge that, just as before, we have given the notion of an investigation an extension. Thus it is a sufficient condition for an individual having carried out an investigation that he should have acquired a belief.

But what about wishful thinking?. Page 8.

But let us get on with showing that there is such a principle. It would help if we could show that the principle 'Alleviate doubt' had work to do. In order to do this we have to follow a perfectly simple procedure; we have to construct an example in which the principle 'Do not have false beliefs' is not violated, but the principle 'Alleviate doubt' is, and it is only be reference to the latter that we can get ourselves out of difficulties. The obvious case in which our second principle is violated runs as follows:

(1) A man, A, believes 'p or q' on evidence E.

(2) All the evidence E is for p.

(3) p is true.

(4) A neither believes nor disbelieves p.

(5) It is perfectly obvious that E is sufficient to justify belief, by A, in p.

Here we have a case in which A has a true belief in 'p or q' and would have a true belief in p if he 'decided' to believe it, and so in either case would not have violated the first principle. u However, the second principle has been floated since he has not alleviated his doubt. So it would appear that the answer to the question 'Is A's belief in "p or q" a rational one?' must be 'No'.

However, it could be argued that by building condition (5) into the case we have prejudged the issue and that there might be is a perfectly good justification for A's apparent perversity. This argument depends upon rejecting the principle 'Alleviate doubt' and runs as follows. The addition of an extra disjunct, q, makes A's belief less vulnerable and so less likely to fail to satisfy the principle 'Do not have false beliefs'. This of argument is quite independent from the sort of evidence A has or has not got for q. There is no doubt that this argument is quite correct, if satisfaction of the principle 'Do not have false beliefs' is our only concern then it is more rational for A to believe 'p or q' than it is for him to believe p.

It is tempting to suggest that we can reject this argument, this line of defence, by showing that it inexorably leads to scepticism. Thus if E, a good argument for p, is a better argument for 'pr or q' then the same argument will show it to to be a better argument for 'p or q or r', and so on ad infinitum. But this means that the only conclusion we can accept is an infinite disjunction, if we accept, as we surely must, that we should only accept the conclusions of the best arguments that we have available. So unless, as seems very doubtful, we can make sense of believing an infinite disjunction then we are led to scepticism. This argument although quite sound is not good enough to show that someone who holds that there is only one epistemic principle, namely 'Do not have false beliefs' is wrong. It fails because someone who holds that position is already, via the preface paradox, embracing scepticism.

Yes

What the defence offered above does entail, to its cost, is the conclusion that a good argument for p~~,~~ is a better argument for 'p or q',is an even better argument for 'p or q or r' ... We may take it that this is not simply counter-intuitive but manifest rubbish.

delete comma

Let us leave further defence of the principle, we have shown that there must be more than one principle, and we have shown that additional principles must be such as to rule out situations such as we have just described in the example; further we have shown that our proposed principle 'Alleviate doubt' does just that. We can do no more until we are presented with another principle that does as much.

What we need to show, more immediately, is how all this helps us. It would seem that despite our now rather clearer picture of the nature of epistemic reasoning we are still open to precisely the same argument, albeit couched in rather different terms. That is the argument based on the preface paradox. If an individual alleviates his doubt in a manner demanded by the principle then can he not also hold, as a further rational belief, the belief that one of his beliefs is false? Therefore he must fail to satisfy the first principle, and given that this is the case does this not demand that he not acquire beliefs, unless he is prepared to be irrational? So, in what way do the two principles we have argued for help us to overcome the sceptical conclusions apparently forced upon us by the preface paradox?

We must look at the argument just sketched out a little closer. What it says is, agreed we have the two epistemic principles 'Do not have false beliefs' and 'Alleviate doubt', but we cannot satisfy them both; we must satisfy one of them, and that one is 'Do not have false beliefs'. But do we have to accept this? In order to see whether or not we do, we have to understand what happens when two normative principles clash. We can see that this is a case where two principles clash. If we satisfy 'Alleviate doubt' then by virtue of

Does this follow?

the preface paradox we will fail to satisfy 'Do not have false beliefs', and the only way of satisfying 'Do not have false beliefs' would be to have no beliefs and hence frustrate the demands of 'Alleviate doubt'. There are a number of points here that are worth elaboration. Suppose A has a set of beliefs B(a), and it comes to his notice that a certain sub-set of B(a) is false, that is, the conjunction of propositions believed is false; then this will only be a case where the two principles clash if exactly the same reasons can be applied to each sub-set of B(a), thereby exhausting it. Thus if A cannot reject some sub-set of his total beliefs B(a), without thereby demanding that he have no beliefs at all, if he applied the same considerations to each of the sub-sets of B(a), then and only then do we have a genuine clash of the two normative principles. (It is to be noted that the force of having to reject a set of beliefs, when the two principles clash, is not having to reject and start again but having to reject and not be able to start again.)

In his articles 'Ethical Consistency'[a] and 'Consistency and Realism'[b] B.A.O. Williams has convincingly shown that when moral principles clash we do not reject one as invalid, as we do, say, in the case of indicative sentences when we reject one as false. Nor do we necessarily curtail the scope of one principle. But just as when we discover that we have conflicting desires we arbitrate in favour of one, i.e., we satisfy one desire rather than the other, without this necessarily casting aspersions on the desire left unsatisfied, so we do with normative principles when they clash. There can be no 'ought' about the arbitration, since principles, like desires, are not validated in the same way as indicative sentences. Thus there can be no argument of the form we have been considering; all that can be said is that in situations where the two epistemic principles clash we do arbitrate in favour of 'Alleviate doubt' and not the other way round. It is this therefore that gives us our solution to the preface paradox.

What the preface paradox and the lottery paradox have shown is that the mode of justification of beliefs that we employ and that proposed by the probabilists suffers a similar flaw. However, probabilistic justification suffers many other flaws - flaws we have good reason to suppose do not infect our actual mode of justification as we showed in Chapter Four. This was sufficient to show firstly that probabilistic justification is not the one we employ, and secondly that there is not reason why we should employ it. In this chapter we have shown how, by accepting a perhaps unexpected complexity in the notion of

(a) P.A.S.S., 1965. pp. 103-24. (b) P.A.S.S., 1966. pp.1-22.

rationality, the flaw indicated by the preface paradox need not be seen to be fatal. This complexity demands a move away from a rather parasitic notion of rationality, to a notion in which we have to accept that there are, possibly, many competing demands between which we simply have to effect a compromise. Such a complex notion, although perhaps lacking in aesthetic appeal, is more appropriate to the complexities of the being it is designed to apply to.

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