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Author(s): P. J. R. Millican

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acquainted with states of my body. We can perhaps conceive that I should be aware of those same states in a different way. I should have to be if I were only related to a body as a sailor is to the ship on which he is borne along. In that case, being nothing other than a thinking thing, I should have to apprehend damage to the body by an intellectual analogue of the vision by which the sailor is apprised of damage to the ship. But manifestly this is not how things are in fact. I am so related to my body that I have an intimate 'inward' way of apprehending my injuries and bodily needs—in having sensations of pain, hunger, thirst etc. The 'particular privilege' by which I call this body mine derives from this relationship.

Descartes tells us that these modes of consciousness arise from the 'permixture as it were' ('quasi permixtio') of the mind with the body. This seems to be a metaphor ('quasi'), drawn perhaps from seventeenth century science. The great problem is how to cash it. Descartes is no help. He remarks to Burman that these matters are 'very difficult to explain; but here our experience is sufficient, since it is so clear on this point that it just cannot be gainsaid' (*Descartes' Conversation with Burman*, tr. John Cottingham, p. 28). Perhaps we may infer from Descartes's resort to metaphor that at this crucial point the phenomena were just too much for his theoretical ingenuity.

University of Bristol

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ON THE TRANSITIVITY OF EPISTEMIC PREFERABILITY

By P. J. R. MILLICAN

R. A. SORENSEN has argued recently that the 'more likely to be correct than' relation is not transitive ('Is Epistemic Preferability Transitive?', *ANALYSIS* 41.3, June 1981). This result is certainly surprising and would, if correct, rule out any treatment of epistemic preferability which conformed to the calculus of probabilities, since any quantitative measure of probability, being numerical, must necessarily give rise to a relation of 'having greater probability than' which is transitive. Sorensen's argument, however, purports to demonstrate the non-transitivity of epistemic preferability without at any point assuming that epistemic preferability is non-probabilistic. This should make us very suspicious.

Let us imagine a game involving three dice, each with six faces which are numbered as follows:

Die A: 1, 2, 9, 14, 15, 16

Die B: 6, 7, 8, 11, 12, 13

Die C: 3, 4, 5, 10, 17, 18

The two players each choose one of these dice, and they throw their chosen die simultaneously. The winner is the player whose die shows the higher score, and we can suppose that the loser is then obliged to pay him one penny.

The interesting thing about this game is that A will score more than B in 21 of the 36 possible combinations (giving a 7/12 chance of A's winning over B, since all combinations are equally probable), while B will in turn score more than C 21 times out of 36 and, surprisingly, C will also defeat A in the same proportion. Thus a gambler who allows his opponent the first choice of a die can be fairly sure of making a profit by choosing his own die appropriately—for every 12 'rounds' played he can expect to gain two pence, by winning 7 rounds and losing 5.

Sorensen claims that this strange phenomenon can provide a counter-example to the transitivity of epistemic preferability. For instance, suppose that three research groups are each given a throw of dice A, B and C respectively, and that money is allocated to each research budget in proportion to the score achieved—say £7,000 for a score of 7; £10,000 for a score of 10 etc. If we assume that the three research groups are attempting to solve three equally difficult problems, and that a greater budget brings a greater chance of success, then, since it is likely that the first group has a larger budget than the second, Sorensen would have us conclude that its results are epistemically preferable to the results of the second group. Similar reasoning would conclude that the results of the second group are epistemically preferable to the results of the third, and the results of the third to those of the first. Epistemic preferability, then, cannot be transitive.

As I suggested at the beginning of this article, the flaw in Sorensen's argument can be seen most clearly if we assume (for the benefit of his attempted *reductio ad absurdum*, if you like) that epistemic preferability is probabilistic. Let us suppose that a research group's chance of success is directly proportional to its budget, for example, a budget of £7,000 giving a 7% chance of correct results, etc. Now, it is true that the budgets of the first two groups are *probably such as* to give the first group a greater *chance* of success than the second; similarly with groups two and three, and with groups three and one. But it obviously *cannot* be right to infer the absurd conclusion that the results of group one are more probable than the results of group two, which are more probable than the results of group three, which are more probable than the results of group one—'mathematically more probable than' *must* be transitive!

Sorensen's mistake is to assume that, because the first group's results are *probably more probable* than the results of the second group, they are

therefore more probable *tout court*. In fact, since the average of the numbers on each of the dice A, B and C is $9\frac{1}{2}$, the average expected budget of each group turns out to be £9,500, and the chance of success $9\frac{1}{2}\%$. The three groups are equally likely to produce correct results, and so there is no epistemic preference amongst their conclusions.

I shall conclude with another, more dramatic, illustration of Sorensen's error. Imagine that a criminal, tied to a post, has the choice of two alternative punishments. If he chooses the first, he will be 'shot' once with a catapult; if he chooses the second, he will be shot once with a revolver whose barrel, containing two bullets and four blanks, has already been spun randomly in front of his eyes (as in Russian roulette). Now, it is *probable* that the barrel is positioned so that the first punishment is more *likely* than the second to inflict a serious injury—in four chances out of six (corresponding to possible positions of the barrel in which a blank, rather than a bullet, is in the firing position) it will be quite impossible for the second punishment to inflict any injury at all. Nevertheless, the rational criminal will obviously choose the first punishment in preference to the second. A high probability of serious injury in two chances out of six outweighs a very small probability in six out of six.

Lincoln College, Oxford

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CONSCIOUS BELIEF

By N. M. L. NATHAN

HOW is it', asks D. H. Mellor, 'that I can unhesitatingly answer almost any "yes or no" question I understand? My answer may be "I don't know", but how do I know that? . . . My knowledge of my beliefs and doubts, though fallible, is vast, and immediately available to me as it is to no-one else. Why is that?' ('Conscious Belief', *Proceedings of the Aristotelian Society* 78, 1977–8, p. 87). The short answer, according to Mellor, is that 'when a question is put to me I become conscious of my belief or doubt on the matter'. This is, he thinks, a true answer, so far as it goes. 'The experience of conscious belief or doubt is familiar enough, as is the fact that it is what enables us to answer questions, and generally to converse.' But Mellor also thinks we need a clearer understanding of conscious belief itself, and goes on to argue that for me to be conscious of my belief that *p* is simply for me to believe that I believe that *p*, where