

BACKWARD CAUSATION

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Every paranormal phenomenon must, in the nature of the case, arouse suspicion and skepticism, but the claim to be able to foretell events which have not yet occurred, which is what we mean by *precognition*, is apt to raise doubts as to whether this concept is even coherent. A number of eminent philosophers, including some like the late C. D. Broad (1967) or C. W. K. Mundle (1964) who were known for their interest in and involvement with parapsychology, came reluctantly to the conclusion that precognition, taken in its literal sense as a knowledge of the future, was not just impossible in point of fact but was logically impossible.

I want to start by considering some of these logical objections that have been brought against the concept of precognition. It has been pointed out, for example, that if an event has not yet occurred, then it cannot have any effects and, in particular, it cannot be an object of knowledge. Something which does not exist may be imagined, but it cannot literally be known. Moreover, even if we disregard this obvious point, in order for a future event to become the cause of my present precognition of it, it would have to exert a backward effect in time and this, it has been said, is inadmissible on at least three counts. First, because it is part of the meaning of the word *cause* that a cause should precede its effect, hence a cause which followed its effect would be a contradiction in terms. Secondly, and more seriously, if, forgetting about the semantics of the case, we do posit a backward causation, this would be tantamount to asserting that we could alter the past. But what has been, has been and nothing that anyone can do after the event can change it in any way. Hence, the very idea of backward causation is a radical absurdity. And, thirdly, even if we could somehow overlook the two previous objections and persist with the idea of backward causation, we should find ourselves committed to the following paradox: If it were possible to intervene in the past then, in principle, we could intervene in order to prevent our own birth. But, in that case, who

was it that intervened in the first place? We would thereby have negated our own existence!

These are not by any means the only objections that have been raised with respect to precognition and I shall have more to say on the point towards the end of my talk but, in the meanwhile, I want to look very closely at the concept of backward causation which I believe is the real root of the trouble. I hope to show that, contrary to what many philosophers have maintained, there is nothing radically wrong with this concept and hence it cannot be invoked as a reason for rejecting precognition on *a priori* grounds. Furthermore, I shall try to show that, once we have come to terms with this seemingly paradoxical idea, we shall be ready to appreciate an exciting new development in experimental parapsychology, namely the study of backward or retroactive PK. In what follows, I would like to acknowledge my debt to a young American philosopher, Bob Brier, who alerted me to this problem and convinced me that the *a priori* case against precognition could be met. Bob Brier propounded his views in a brief but important monograph entitled *Precognition and the Philosophy of Science*, which was published in 1974 with the subtitle "An Essay on Backward Causation." Brier, in turn, was following the lead of the English philosopher Michael Dummett, whose article "Bringing about the Past" first appeared in the *Philosophical Review* for 1964. But, having acknowledged my intellectual debts, I consider myself free to develop my theme in my own way and draw my own conclusions. Let us return, therefore, to the objections which I have already listed and see whether they are really as cogent as they may at first appear.

The idea that future events do not exist and can, therefore, have no conceivable influence upon the present is a case of begging the question. For, in fact, many if not most contemporary philosophers of science who have written on the problem of time take a realist or objectivist view of the temporal order. I mean by this that they deny that the expressions *past*, *present*, *future* have anything more than a subjective or, at least, mind-dependent basis, indicating the relationship between the observer and the event in question, like the expressions *here* and *there*. In a mindless universe, they argue, no particular instant of the time series would have a preferential status over any other instant. Each event would still stand to any other event in the relationship *earlier than* or *later than* but none would stand out from the rest as representing a unique *now*, that is, the instant which the universe had attained on the time series. All events would simply co-exist in the timeless sense in which we

talk of facts as existing or *being the case*. Now, I am not saying that the realist view of time is necessarily the correct one or that the concept of *now-ness* or *becoming*, as something extra which an event attains when it actually takes place, is a concept with no clear meaning. I mention this view simply to show that one cannot just assume, without further argument, that future events are any less real than past or present events. And, certainly, those cosmologies which treat the universe as a single four-dimensional continuum, in which every object is represented by a certain determinate world-line, recognize no division of the universe into a past, present and future.

Let us agree, then, that there are no *a priori* objections to our treating future events as sufficiently real to have causal consequences. The question we must then consider is whether the direction of such causation must always extend from earlier to later, never from later to earlier. Let us look again at the reasons that are offered for refusing to admit any sort of backward causation. First, I do not think that the purely verbal objection need detain us for long. It may well be the case that, in ordinary language, a cause is always understood as preceding its effect, since this, after all, is what happens in ordinary experience. But, given new circumstances, linguistic usage tends to become reasonably pliable and if we can show that there are paranormal cases where the cause comes after its effect, I am quite sure we would not be deterred from acknowledging them by the constraints of language. At worst we might have to write the word "cause" in adverted commas, to signal that this was a rather special kind of cause that we were dealing with.

What is much more problematic is whether the admission of backward causation would lead us into a logical impasse. It seems at first that this would indeed commit us to asserting that the past could be altered and this, I would agree, is nonsense. But, although we cannot alter the past in the sense of making something to have happened which did *not* in fact happen or, conversely, preventing something from having happened which *did* in fact happen, it does *not* follow that what *did* happen might never have happened, or might have happened differently, *but for* certain later events. We may find this supposition strange, but it is certainly not illogical. In fact, the case is no different logically when we are considering the future. If what has been, has been, then, equally, what will be, will be and in this sense one can no more alter the future than one can alter the past. But, of course, we quite rightly believe that what will be may depend on what we now do and, in this sense, we can *influence* the

future even if it makes no sense to talk of altering it. The fallacy which previous philosophers have fallen into arises from the fact that they failed to observe Brier's distinction between altering the past and influencing the past. The point to grasp is that the past might not have been what it was, had it not been for some action in the present.

We are now in a position to deal with the other paradox of the man who by dint of backward causation cancelled his own birth. Given the fact that a person was born on such and such a date, it follows that nothing thereafter can *alter* this fact. But it does not follow logically that his having been born might not have been due to some subsequent action that was taken. For example, a pious Christian mother might well believe that her child would never have been born, but for the fact that, at the appointed time, she had it baptized. Now, we may mock her for her credulity as much as we please, but we cannot fault her logic. The fact that we cannot use backward causation to cancel our birth is no more problematic than the fact that we cannot cancel any event once it has occurred.

Critics of backward causation point out that causation is an essentially pragmatic concept. Thus, we say that A is the cause of B when we are satisfied that we can bring about B by taking action involving A. However, if we know that B has already occurred, then any action we take involving A would be superfluous, since we have now obtained B whether or not we do A. Conversely, if B has *failed* to materialize at a given time t_1 , any action we take involving A is then futile insofar as it was designed to make B occur at time t_1 . Hence, from the pragmatic point of view, every instance of backward causation must be either superfluous or else futile.

Brier offers an amusing example to show, nevertheless, that backward causation need not be devoid of pragmatic import. Suppose a man were to discover, by sheer trial and error, that whenever he received a letter through the post he had only to clap his hands and, when he then opened the envelope, he would invariably find there a check made out in his favor, while, conversely, if he forgot or failed to clap his hands there would be no check. In this situation, Brier asks, would any of us, whatever our philosophical prejudices, refrain from clapping our hands? And, if so, could any of us honestly deny that clapping our hands at the right moment was a necessary condition or cause of the check having been inserted into the envelope at an earlier time? Now, you may say at this point: well, supposing the envelope were transparent, what then? The man would then know as soon as he caught sight of the letter either that

there was a check inside, in which case he would not bother to clap his hands, or that there was no check, in which case no amount of hand-clapping would help him! And yet, surely, a causal connection which depended for its validity on the knowledge or ignorance of the agent would be a very queer sort of cause.

But consider, any causal connection whatsoever is circumscribed by certain boundary conditions. Indeed, as Ducasse (1969) and other philosophers have stressed, causation actually involves a triadic relationship, A causes B under conditions C. Striking a match will cause a flame but not if the match is damp or the surface is too smooth. It is not, therefore, surprising if what we might call the epistemic aspects of the situation should constitute the boundary conditions where human actions are involved. Here, again, a comparison with actions directed towards the future may help to clarify this point. Thus, if I *know* that tomorrow I shall be killed, it follows logically that nothing I can do today can prevent it, since knowing something logically implies that it is the case, but, granted that I do *not* know whether I shall be killed, it is entirely rational for me to take steps to avoid getting killed.

Similarly, if the letter I receive arrives in a transparent envelope, so that I know that there is no check inside, no magic on my part can conjure one into having been inserted, but, granted that the envelope is opaque and that I do *not* know, it is entirely rational for me to clap my hands. What makes these two cases appear different is that normally we do *not* know what lies in the future, whereas normally we *do* know, or at least we can very easily find out, what has happened in the past. But this is an empirical difference as between past and future and, of course, there are many such empirical differences. The logic of the two situations, however, is entirely symmetrical and it is the logical aspect that now concerns us. From the foregoing we are, I submit, entitled to conclude that there are no logical objections to saying that A is the cause of B, so long as we believe that B would not have happened but for A, regardless of whether A is earlier than B or B is earlier than A.

Up to this point we have discussed the question of backward causation in purely hypothetical terms, using examples drawn from the realm of fantasy or superstition. I now want to turn to the actualities of parapsychological research and consider its relevance in that context. It has been widely held by parapsychologists that ESP is essentially independent of space, time and matter, so that when we use our extrasensory powers, instead of relying on our sensory channels and their associated brain-mechanisms, there is no

inherent reason why we should not become aware of events occurring in the past or the future as much as events occurring contemporaneously, just as there is no inherent reason why we should not become aware of events occurring in remote places or events shielded from us by intervening matter. In the case of PK, however, it has been the practice to use target-systems located in the subject's immediate vicinity and much less has been made of the potential time and space transcendence of the phenomenon. And yet it would be very odd if PK behaved any differently in this respect from ESP, considering that the two are so closely linked that it is customary to subsume both phenomena under the generic term *psi*. The trouble is, however, that it would, in the nature of the case, be very difficult, if not impossible, to demonstrate unequivocally the existence of a PK effect directed towards the future that would be the analog of precognitive ESP. For, whereas in a precognition experiment the subject has simply to record his guess at time t_1 , and then wait for the target event to occur at time t_2 , against which he can compare it, in the case of PK there is no objective way of registering the relevant mental effort at time t_1 that might be responsible for the target event at time t_2 . The point is that PK is known only through its effects. It cannot be identified with any sort of conscious effort on the part of the subject. Moreover, even if one went to the extreme of killing the subject between the time t_1 when he is given the instruction to try exerting a PK effect on the future and the time t_2 when the effect is observed, one could still not rule out the possibility that the effect was due to a delayed-action PK or, even, that the deceased subject was exerting a PK effect from the life beyond, as it were.

We may note in passing that the problem of demonstrating forward PK is exactly matched by the problem of demonstrating backward ESP, otherwise known as retrocognition. In the latter case, although the subject's response can be recorded prior to verification, the verification would not be possible but for the existence of certain records in the present. Hence, there can be no unequivocal test of retrocognition. Fortunately, there is no such logical barrier in the way of demonstrating unequivocally the existence of a backward or retroactive PK, which is what I want to talk about now. The way it can be done is as follows: Some physical effect can be automatically recorded at time t_1 , but kept secret until later. At time t_2 , the subject is instructed to try producing this particular physical effect or outcome on this particular target-system and then, but only then, is the result checked against the original record at time t_1 . This, bas-

ically, is the method used by Helmut Schmidt in his recent experiments on PK with time displacement, but others, too, have been working independently along similar lines elsewhere (Janin 1974). For a straightforward test of PK, Schmidt uses, as his target-system, a device known as a "random number generator." This usually has a binary output such that, when it is operating in isolation, the two possible outcomes will occur with approximately equal frequency. The PK task is to upset the randomness of the machine by getting it to generate an excess of the one digit or the other, depending on the arbitrary instruction that is laid down. A prominent feature of the Schmidt set-up is the feedback system. This may take a variety of forms, visual or auditory, for example a recording pen that shifts from side to side or a fluctuating tone etc. The principle, in every case, is that the feedback is controlled by the random number generator in such a way that an excess of hits or successful trials will produce a shift in one direction, while an excess of misses or unsuccessful trials will produce a shift in the opposite direction. This feedback is not just an amenity designed to engage or sustain the interest of the subject; it is, according to Schmidt's (1975) mathematical model of psi, a crucial part of the whole process. It is, indeed, the feedback which is said to activate the psi source. However that may be, the subject is encouraged to concentrate his attention on the feedback and to try getting it to move in the desired direction, and not to bother about the random number generator which actually governs it.

This, as I say, is what happens in the straightforward or contemporaneous type of PK test. To convert this into an experiment on retroactive PK, only one modification is necessary. The output of the randomizer is now determined by a solid state memory on which a sequence of digits has been recorded, based on a previous output from the machine. Hence, instead of generating a fresh sequence of random digits by being triggered from a source of quantum indeterminacy or of electronic noise, it now merely repeats the series recorded at this earlier time. So far as the subject is concerned, however, nothing has changed; he does not need to know that the situation is any different from what it is in the standard case. Nevertheless, if the subject is to succeed in making a significant score under these new conditions, it is necessary for him to influence the behavior of the machine, not as it *is* currently, since it is now strictly determined, but as it *was* when the target sequence was originally recorded. His PK, in other words, is now operating retroactively. Although, so far, very few such experiments have been

reported, it is beginning to look as if PK with time displacement may be a fact (Schmidt 1976).

In our department at Edinburgh, Richard Broughton, one of my postgraduate students, has already started work on a project which depends on the retroactive properties of PK. His point of departure is the notorious *experimenter effect*, that is, the idea that the experimenter himself, rather than the ostensible subject, is the real psi source which is responsible for the positive results which are observed. Without some such hypothesis, it is hard to explain why certain parapsychologists obtain positive results time and time again while others hardly ever do so. Indeed, Broughton had begun to wonder whether his own positive results, which he had himself obtained earlier, while working on his thesis project designed to demonstrate a hemispheric lateralization effect in ESP, might not have been the product of such a psi experimenter effect. In this new project, what he does is to generate a certain expectation in his subjects regarding the kind of scores which they may expect, more specifically, that they may expect to do better under one condition in which they perform their ESP task than they will under another condition, on account of certain unspecified artifacts. Actually, there is no objective difference between the two conditions under which they perform, and it is only when they go to the computer to receive a print-out of their scores at the termination of the experiment, that they are told which was the high-scoring condition and which the low-scoring condition, the assignment being arbitrarily determined by the computer. This means that the expectation is generated in the subject, not at the start of the experiment, but only when it is all over. The idea, if you follow me, is that any significant difference that is then found as between these two arbitrary categories must be due to the subject's retroactive PK. In other words, what he expects to find at time t_2 must influence the scoring level recorded at time t_1 . A pilot experiment along these lines has already been run which did in fact produce some significant differences and Richard Broughton has been reporting on them to the Parapsychological Association Convention at Utrecht (Broughton 1976). There are further refinements in his experiment which I have not bothered to mention and a much larger experiment is planned for next year, which the Parapsychology Foundation has generously agreed to support, but I have taken it as an illustration of the fact that backward causation is beginning to enter into the current thinking of experimental parapsychologists.

Nor is it only PK that operates retroactively. If we adopt the Schmidt axiom, that all psi interactions depend critically on feedback, then ESP, too, involves backward causation, proceeding from the moment at which feedback is received to the earlier moment in time at which the response was given. Even precognition, on the Schmidt model, is elicited not, in the first instance, by the future event that is precognized, but rather by the subsequent confirmation, whether by the subject himself or the experimenter, that the event in question has come to pass.

Armed with the concept of backward causation let us finally turn back to the problem of precognition which I introduced at the outset of this paper. Undoubtedly, one reason why precognition has engendered so much resistance is that to many people it seems to cut at the root of the belief in free-will. If our future actions could be known, it is feared, this would make a mockery of our claim to be able to determine our actions by a spontaneous act of will. Applying the concept of backward causation, however, this fear would seem to be unfounded. For, when I spontaneously choose or decide upon some course of action, then my choice or decision could just as well have caused you to have had a precognition of it the week before, as it could be the cause of your remembering it a week later. Whether this entirely disposes of the uneasiness we all feel at the thought of the future being already in some sense laid down and knowable, I do not know. Certainly, we like to feel that the future lies open before us waiting to be created, but whether this intuition is philosophically justifiable, I must leave you to judge. I will say, however, that there is one restriction we must impose on the scope of precognition if we are to retain the idea of free-will. We clearly cannot both precognize our own future actions and, at the same time, freely decide upon them when the time comes. For, deciding implies being in a state of uncertainty which is terminated only when the decision is made. But, if we already *know* what we are going to do, it would be absurd to talk of our then *deciding* what to do. Having perfect precognition, which would include knowing all one's future actions, would indeed be incompatible with living one's life in the sort of way that characterizes human existence.

I am not claiming that the concept of backward causation can solve all the problems connected with the idea of precognition—there is, for example, the notorious *intervention paradox* which raises quite different questions—but what I have tried to do in this paper is to show that precognition cannot be dismissed on logical grounds

alone, and that the idea of backward causation, so far from being nonsensical, is now being taken seriously by more and more experimentalists as a basis for testing psi in the laboratory.

REFERENCES

- ¹ Brier, Bob, *Precognition and the Philosophy of Science: An Essay on Backward Causation*. New York: Humanities Press, 1974.
- ² Broad, C. D., "The Notion of Precognition." In J. R. Smythies (Ed.) *Science and ESP*. London: Routledge, 1967.
- ³ Broughton, Richard, "An Exploratory Study of Psi-based Experimenter and Subject Expectancy Effects." (Paper at 19th annual convention of the Parapsychological Association) see *Research in Parapsychology 1976*. Metuchen, N.J.: Scarecrow Press.
- ⁴ Ducasse, C. J., *Causation and the Types of Necessity*. New York: Dover, 1969.
- ⁵ Dummett, M. A. E., "Bringing about the Past." *Philosophical Review* 23, 1964, 338-359. (reprinted in R. M. Gale (1967) *op. cit.* below)
- ⁶ Gale, R. M., (Ed.) *The Philosophy of Time: A Collection of Essays*. New York: Macmillan, 1967.
- ⁷ Janin, Pierre, "PK into the Past?: An Exploratory Experiment." Unpubl. 1974.
- ⁸ Mundle, C. W. K., "Does the Concept of Precognition Make Sense?" *Internat. J. Parapsych.* 6, 1964, 179-198.
- ⁹ Schmidt, Helmut, "Towards a Mathematical Theory of Psi." *J. A. S.P.R.* 69, 1975, 301-321.
- ¹⁰ Schmidt, Helmut, "A Logically Consistent Model of a World with Psi Interaction." In *Quantum Physics and Parapsychology*. Parapsychology Foundation Inc., 1975.
- ¹¹ Schmidt, Helmut, "PK Effect on Pre-recorded Targets." *J. A. S.P.R.* 70, 1976, 267-293.

DISCUSSION

THAKUR: You did mention that time can be viewed not as something extending out there, but something that minds read into it. Now, this is very interesting and that is what makes a rigid division between past, present and future implausible. But then, given that fact, an important question immediately arises. One can legitimately say that these minds which, if you like, create the past, present and the future, are conceptually determined, and part of the conceptual determination of these minds is that future events aren't supposed to exist. Our minds are made in such a way, apparently, that we don't acknowledge the existence of future events, and that means, from this angle, it does seem to be the case that future events can't exist. To this, it won't be an answer, except a very odd one, to say, "Well normally they don't, but in the case of special people, or under special circumstances, they do." In order to do that one would have to devise a larger theory which will make room for this.

BELOFF: I didn't follow your point about "minds creating past, present and future . . ."

THAKUR: "What I thought I was doing was what you suggested, namely, that it's the context of minds that brings these divisions, and one can take that point and then come up to formulate that particular objection in the way I just stated that minds, one could say, have certain conceptual determinants, certain things they will allow and certain things they won't. And one of the conceptual determinants is that future events aren't supposed to exist. Most people just don't believe that future events exist, so the net result of this objection, put in this way, would be the same.

BELOFF: Of course, I admitted at the outset that both the idea of backward causation and the idea of precognition were paranormal concepts. In other words, in some sense, it violates our common sense assumption about the world, including the fact that the future is non-existent—a sort of common sense assumption that would be somehow violated by the claim to know the future—that if you claim to know something, it exists in some sense. So, I entirely agree with you that it creates a paradox of a sort, but not a logical difficulty or objection to the concept of backward causation. And I don't think that you are exactly claiming that it does, are you?

THAKUR: No. I'm not claiming that it's a logical objection, because it is obviously confined to a particular feature of human minds, the way they're constituted—so in that sense it is an empirical one rather than a logical one. But while it is an empirical feature, it's a sufficiently powerful one to exercise as much of constraint as a logical one would do.

FRENCH: First of all, the idea that future events are real or as real as present events and past events, is also a necessary element in prudential thinking, and a number of ethicists have pointed this out recently. But, to the point of your paper, I'm wondering if you would care to talk about what appears to me to be an implicit ontological commitment that you're making, regarding the existence of future events. I take it that the ontology suggested has all events existing contemporaneously in some way or another. If that's the case, then I'm also interested in the sense of the word *backward* that you're using, because it seems to me that that may only be a convenient handle to use for ordinary people to understand what you're talking about. Perhaps it doesn't serve the function of being a technical term.

BELOFF: Well, I haven't used the term *causation* in a very technical way, really. I'm nothing of a professional philosopher. I mean, I wouldn't try to formalize it to that extent, so the notion I'm working with is a

very informal one. I mean, I'm satisfied "A" is the cause of "B," if I think "B" wouldn't have occurred but for "A." As informally as that. And this can still hold, even though there is a certain *prima facie* paradox about talking of forward and backward links in a four-dimensional world of events. But I don't think it's an insuperable difficulty; it can be given a special meaning. One would still have causal connections, it seems to me, whether your universe is in the process of becoming, or whether you take it as a kind of block extension of events in four dimensions, or whatever. I would maintain that, though I can't obviously argue it in detail.

SERVADIO: I think that an additional element of evidence about the possibility of the future influencing the past in qualitative parapsychology, is given by what could be called *protective precognitions*. We know that sometimes a person has a certain dream in which he finds himself in a very difficult and perhaps a lethal situation, but then, in what we can call the future, something happens and at the last moment the fatal issue is avoided. So it seems that from what we call the future, a certain warning has come to the person, giving this person the possibility of dreaming something and of avoiding the final ill consequences of what he has dreamt.

BELOFF: Of course, what you've just said raises one very, very crucial difficulty for precognition, which is the intervention paradox. Because, you see, if he avoids this dreaded event, in what sense was his dream a real knowledge of the future? That future never occurred. And this leads one on to all sorts of wild speculations about branching universes as an alternative, ideas about what precognition might be. I cut this out of my discussion because it would lead me too far away from the idea of backward causation which I was concerned to try and defend. But certainly, a precognitive dream is a good example of backward causation, in my sense.

HAYNES: There were two points raised by this talk which I'd like to ask about. One is: Is one thinking of a future event as something caused by the present, or as something as an idea? For instance, I was asked just now what was going to be done about the SPR Centenary. That is an idea of a future event which is going to work backwards and make us take this or that course, but it's not, I think what Professor Beloff has in mind. The other thing is: How far can what looks like backward causation be attributed to a telepathic or clairvoyant acquaintance with the circumstances that look like bringing about the future event itself, so that the event itself is not necessarily determining what is happening now, but we are aware of its present causes?

BELOFF: In the first point you're using backward causation in a somewhat different sense. This is not quite relevant to me, because the idea after all, precedes the event in your first example, and therefore this isn't backward causation as I was using the expression. The second point, if I understood you, is that precognition might be a sort of reading into the present tendencies of the universe, what will come about rather than projecting into the future. This way of conceptualizing precognition is one that a number of philosophers, the late Adrian Dobbs, for instance have tried to work out and use. But, to me, it's a more far-fetched and a more complicated way of trying to think about precognition, and I think it was really sold to us, partly, because people have mistakenly thought that precognition was a logical impossibility, therefore they had to evolve some other theory such as reading the objective probabilities into the present.

MATTUCK: You mentioned the fact of secrecy after the random number generator prepares the tape of trials. If the RNG prepares a tape on Tuesday and everything is held secret so that no observer whatsoever knows what the content of this tape is, then, when it's played on Wednesday for the subject, I can see the possibility of his exerting backwards causation and causing a change to take place on the tape which was made the day before. But, what would you expect if somebody else looks at the tape on Tuesday and it's completely random? Then it should be impossible for the subject to influence the tape on Wednesday, because now it's not secret any more. I.e., somebody knows what the content of the tape is and if the subject then influences on Wednesday the tape that was made on Tuesday, it seems to me there would be a logical contradiction of the sort which you get in your transparent envelope paradox. I would like to know if the experiment has been done in these two ways—in the first case, keeping the contents of the tape prepared on Tuesday secret from *everybody* and then playing it on Wednesday; and in the next case, allowing one observer to observe the tape just after it was made on Tuesday, and finding on Wednesday that the subject is unable to influence the tape and shift it in some sort of non-random direction.

BELOFF: So far as I understand, a paradox arises only if the subject himself is allowed to inspect the information, not if some other observer does. Although, it is quite true that Schmidt has always taken great care, and so did others who followed him, to keep the tape secret even from himself. But I think that the sort of logical epistemic difficulty arises only when the subject himself knows whether there's an excess or a deficiency of a particular digit, and this makes it, as it were,

futile or redundant for him then to try influencing it. It would be, of course, desirable, that the experiment you've outlined should be performed, I mean just as an empirical demonstration, but I foresee only logical difficulties where the subject himself knows what is now the case.

MATTUCK: I think that the logical difficulty would also occur if, for example, Schmidt himself or any other observer observed the tape and wrote down what the content of the tape was. It's not just a matter of logical difficulties with the subject, but logical difficulties which would arise if *any* observer in the universe looked at that tape and noted that it was random, then it should be impossible for the subject to influence it.

BELOFF: There, I'm afraid, we differ. Let's remember what the subject is trying to do. Suppose he's trying to produce an excess of "ones" rather than "zeros" in the output. Now, Schmidt can look at the print-out and see that there is an excess of "ones." He doesn't tell the subject this. The subject is instructed to produce an excess of "ones," and he is successful. Now, we, knowing that this experiment has consistently given this kind of effect, will conclude that what produced the original excess of "ones" was the future exertions of the subject towards that end. What happens intermediately does not seem to me to matter very much, only in these very special cases where the subject himself knows, because this, as it were, paralyzes him epistemically.

BERENDT: Coming from the qualitative side in parapsychology, I would like to know the viewpoint of Dr. Beloff about the chair tests by Croiset; that's my first question. The second is this: As our whole development in parapsychology to date seems to tend to changes in our ideas of nature, making a broader aspect possible, it could be that our approach should be changed concerning our predominant causal thinking about nature. I mean, that the cause/effect relationship is certainly for us the basic one, but there are other relationships which may add to it. I only wanted to add one point. There are certainly great difficulties in bringing a happening in the future into a naturalistic explanation. There is one theory which looks upon sayings by a paragnost about the future as though the paragnost sees a framework, as Neuhäusler calls it—a blueprint—but as it is not the original, it must not be taken as reality in every detail. It could also be that paranormal PK or paranormal mental process could change, and then, of course, the prediction is not precise, but still keeps the framework of what was said.

STANFORD: Just for the record, would you, please, specify in more

detail the precautions which Schmidt took to rule out contemporaneous experimenter psi mediation of the effects.

BELOFF: I wonder whether Monsieur Janin might care to comment on that, because he's a great expert in precautions.

JANIN: I would say that Schmidt did not methodically take precautions to avoid the effect. At least, I have the impression that in my own experiments, which I undertook quite independently of Schmidt and at about the same time, I was much more concerned than he about the problem. Although the question has somewhat slipped out of my mind at this moment, I do remember that in some of his backward PK tests, the future target side of the random number generator was already known to the experimenter at the time of target recording. In such conditions, an experimenter's effect is at least as likely to explain whatever PK is actually observed as would the future subject's future wish.

STANFORD: I just would like to mention for the record that I do know that, in at least one of his backward PK studies, Schmidt did take the specific precaution of making a number of tapes and only one was a relevant one for a given subject; the others were not and he was totally blind as to which tape was the non-used tape and which one was to be the one that was used.