

of the uncertainty as to when to conclude the experiment, the scripts became uncomfortably numerous so that, at the end, the likelihood of some chance correspondences between the scripts and the contents of the last envelope may have been large and was difficult of assessment.

The only remedy for this seems to be the one suggested for the previous difficulty, that an indefinitely large number of checks should be possible without spoiling the test. Then uncertainty as to when the final message comes through would be unimportant; any suggestion that is received can be tried out at any time.

I was trying to meet these difficulties when I devised the cipher test (described in the *Proceedings* of the S.P.R., 48, 253-63 and 342-3), in which the target is the key to a message in cipher. I think this is nearer to the ideal posthumous test than anything else at present available but I do not imagine that it is the final solution to the problem. Particularly I am aware of the defect that it might be difficult for the communicator to remember the necessary key words. Originally I had intended to leave with the S.P.R. a picture which would serve to jog my memory, but I have decided not to do so since this would weaken the evidential value of the test to an unknown extent. I cannot be sure that what would suggest the key to me might not also suggest it to someone else. Other members of the S.P.R. may think of better ways of surmounting the difficulties in posthumous tests that I have mentioned. The main requisite, I think, is that a satisfactory test must be one which allows for an indefinite number of checks without spoiling the test.

'SCIENCE AND THE SUPERNATURAL'

THIS is the title of an article by Dr G. R. Price which appeared in the 26 August issue of *Science*, published by the American Association for the Advancement of Science, Washington, D.C. Its author is a research associate in the Department of Medicine, University of Minnesota, Minneapolis. Dr Price is not the first scientist to find himself unable to accept research findings that are, in Dr Rhine's words, 'radically contradictory to contemporary thought.' What is interesting about his article is that (1) it appears in a leading scientific journal, (2) unlike so many critics of parapsychology, he has made a thorough and careful study of the literature, and (3) he has concluded that the hypotheses of sensory cues, recording errors, unconscious whispering, statistical artifacts and the like are all untenable and that the only alternative to accepting the results is to assume wholesale fraud and collusion.

Unprejudiced readers of *Science* may well be less impressed by Dr Price's own hypothesis than by his rejection of the others.

The summary of the article given below is printed by kind permission of Dr Price and the Editor of *Science*. It is followed by the reply sent by Dr Soal for publication in that journal. In the summary, for which we are indebted to Mr Christopher Scott, and in Dr Soal's reply the references have been omitted for reasons of space.—ED.

SUMMARY OF ARTICLE BY DR G. R. PRICE

During the last 15 years scarcely a single scientific paper has appeared attacking the work of the parapsychologists. In the face of improved experimental techniques, opposition has been virtually silenced.

ESP, if real, cannot be dismissed as unimportant. Though the scoring rate is low, communication theory shows that, by appropriate coding and reiteration, such a faculty can be used to transmit messages with any desired degree of accuracy. The existence of such a simple and cheap means of reliable communication would have obvious practical value.

ESP is more than a surprising new observation. It differs radically from other natural phenomena in that we cannot even imagine a mechanistic theory, however much we assume, which would give a detailed account of its operation. Here the main difficulties include the manipulation and direction of the faculty (how do we pick out a 'red' card in a dark room? how do we locate the pack of cards 100 miles away?), and the problem of how the brain can interpret the raw data of ESP. Moreover, what explanation is conceivable for precognition?

The seemingly direct action of psi, without the intervention of detailed mechanisms, distinguishes the phenomena from those of science and leaves no alternative explanation but the spirit hypothesis. Thus parapsychology, though camouflaged with scientific trappings, still bears in abundance the markings of magic.

'If, then, parapsychology and modern science are incompatible, why not reject parapsychology? We know that the alternative hypothesis, that some men lie or deceive themselves, fits quite well within the framework of science. The choice is between believing in something "truly revolutionary" and "radically contradictory to contemporary thought" and believing in the occurrence of fraud and self-delusion. Which is more reasonable?'

In some of Rhine's work and most of Soal's every explanation has been effectively eliminated except ESP or fraud. While everyone knows that deceptions and hoaxes, simple and elaborate, do occur, we are most reluctant to believe that any particular person, especially someone we know, can be guilty of organizing a deliberate deception. Yet the literature shows that the most intelligent and eminent men have been deceived by trickery. In judging the likelihood of fraud, we

should ignore vague, psychological criteria and base our reasoning (1) on such evidence as would impress a court of law, and (2) on purely statistical considerations; we should ask, not whether it is probable that the given individual (not known to us personally) would commit a fraud, but whether it is probable that there should exist anywhere in the world of over 2 billion inhabitants a few people of the desire and ability to produce false evidence for the supernatural.

Dr Price then goes on to consider the work of Soal, as that which has generally been held the most impressive, and to 'demonstrate that Soal *could* have cheated if he wanted to, and that therefore we should demand better evidence than his before we believe in the supernatural . . . it should be clearly understood that I am not here stating that Soal or any of his associates was guilty of deliberate fraud. All that I want to do is show that fraud was easily possible.'

' . . . if I were myself to attempt to duplicate his results, this is how I would proceed. . . . I'd want four confederates to imitate the Shackleton experiments. For imitating the Stewart series, I'd probably want three or four. . . . In recruiting, I would appeal not to desire for fame or material gain but to the noblest motives, arguing that much good to humanity could result from a small deception designed to strengthen religious belief.'

As regards procedures, 'Like a competent medium, I would want several alternatives available, so that any sceptic who suspected one procedure could be confronted by a repetition performed under conditions making the suspected procedure impossible. . . . At about 90 per cent of my sittings, the original sequences [of random numbers] would be taken from lists provided by me. Here are a few of the possibilities :

'*Procedure 1.* The Percipient and the Agent are "in the trick". The Agent arranges the [five] code cards as previously directed by me, and the Percipient writes down a memorized sequence or takes a list from a drawer if no outsider is watching him. (This would be a preferred procedure in most experiments except when an outsider determined the order of the code cards. It could succeed with outsiders as EA and EP.)

'*Procedure 2.* The Percipient and the Agent (or the EA or an observer) are "in the trick". The code card order is determined by an outsider. The Agent (or the EA or an observer) notes this order, classifies it into 1 of 6 groups, and signals the group number to the Percipient before or after the run. . . . For example, the Agent glances at the backs of the cards and then says: "Ready." "All ready." "Yes, I'm ready." "Yes, ready."—And so forth. The Percipient then takes from a drawer the designated guess sheet, which is already filled out in his hand writing. . . .

'*Procedure 3.* The Percipient and the Agent are "in the trick". The Agent notes the card order and signals it . . . before the start of the run. The Percipient has memorized a number sequence, and he uses the card order to encipher each number mentally. (This can work with

outsiders watching both the Agent and the Percipient and shuffling the code cards ; or if the Agent is an outsider, the signalling can be done by an observer who shuffles the cards.)

Next consider some of the procedures that could be used even when the number sequence was not known to me in advance :

'*Procedure 4.* The Percipient and the Agent are "in the trick". They have copied or memorized the same lists of letter symbols. During the run the Agent records (concealed by the box) the numbers corresponding (precognitively) to the letters that he knows the Percipient is guessing, and at the end he rearranges the code cards to give the desired degree of success. . . .

'*Procedure 5.* The Percipient and the EA are "in the trick". The EA learns the order of the code cards and signals information to the Percipient during the run. The Percipient has memorized a random sequence of letter symbols. The EA, in calling out the serial numbers, slightly alters his voice or timing a few times during each run (5 times per 50 trials to give 14 hits). Ordinarily the Percipient is to guess at random, but at each signal he writes down the next letter on the memorized sequence. (I would use this method particularly in experiments when an outsider who wore glasses served as Agent. Then the preferred experimental arrangement would be that in which the cards are turned face up for 30 seconds, the screen aperture would be located as it was in the Stewart sittings, and the lighting would be so arranged that the EA could see the cards by reflection in the Agent's glasses.)

'*Procedure 6.* The Percipient plus the EA, the *Recorder*, or the Agent are "in the trick". In runs where the number sequence is generated by counters, I would have the EA draw counters of the needed colour at particular points, or the Recorder could keep false records of counters drawn. And in some experiments, procedures 1, 4, or 5 could be used.

"The procedures that could give the highest degree of success, and that thus would be chosen when I wanted simultaneous "-1" and "+1" or "-2" and "+2" successes, are procedures 1 and 3. For long-distance experiments, procedures 1 and 4 would work. Or I could employ procedure 2 by telephoning the Percipient after the sitting to tell him which lists to mail in.

"Many other procedures are possible. The six chosen for description were selected as samples of what can be done by simple means. Mental abilities required are similar to those needed for playing bridge competently, except that some collaborators would need a little memory training. Use of special apparatus or of collaborators with the abilities of a good stage conjuror would open up numerous new possibilities. Thus it should be clear that Soal's work was *not* conducted "with every precaution that it was possible to devise."'

Dr Price goes on to ask why, though much more nearly fraudproof tests can be devised, none has ever been carried out, and no clear demonstration has ever been made before 'hostile, pig-headed, and sceptical critics.' He discusses and criticizes the answers to this question that have been offered by parapsychologists. Finally he describes a

number of tests which would provide sufficiently conclusive proof of various types of ESP. These tests would be carried out under the direction of (but for the most part not in the presence of) a committee of 12, including 'two experimental psychologists, two experimental physicists, one statistician, and three conjurors or other experts on trickery—all prominent men and all strongly hostile towards parapsychology. . . . Then probably most scientists would . . . be prepared to believe in psi phenomena in preference to believing that the entire committee was dishonest or deluded. In addition . . . the chairman of the committee should be a person with a record of success in psi experimentation, for it is claimed . . . that the personality of the chief experimenter may in some psychic manner determine success or failure. . . .' We then design tests 'such that the presence of a single honest man in the "jury" will ensure the validity of the test, even if the other 11 members should co-operate in fraud.'

The appropriate test for precognitive ESP of the type allegedly shown by Shackleton would be as follows :

'Imagine a radioactive sample of high activity, plus a scintillation counter with ring-of-five scaling circuit and indicator lamps corresponding to Soal's five animal symbols. An accurate timing circuit turns off the counter at set intervals. The circuitry is wired in such open fashion that inspection is easy. The apparatus is battery-powered and is placed in a shielded case, with nothing penetrating through the shield except windows to show the indicators. The percipient and the telepathic sender can be wherever in the world they wish, together or far apart, in the same room with the apparatus or across the ocean from it, alone or with whatever company they want. The guesses of the percipient (transmitted via radio or cable, if necessary) are indicated in some visible form, and a single motion-picture camera records both guesses and subsequent "calls" of the number generator.'

Dr Price ends by expressing the recommendation that, until a demonstration on one of the lines suggested by him is provided, his fellow-scientists should join with him in withholding belief.

DR SOAL'S REPLY

I have read with some amazement an article on 'Science and the Supernatural' in the August number of *Science*. In this paper the author suggests fraudulent collusion between the chief experimenter (presumably myself) and a number of highly respectable people as an explanation of the significant results obtained in the card-guessing work carried out with Mr Basil Shackleton and Mrs Gloria Stewart reported by Mr Bateman and myself in *Modern Experiments in Telepathy*. (London, Faber and Faber; New Haven, Yale University Press: 1954). Moreover, Dr Price makes these suggestions without being able to produce the least fragment of factual evidence that any such fraudu-

lent mal-practice ever took place. It is, I think, safe to say that no English scientific journal would have published such a diatribe of unsupported conjecture. *Nature*, the leading English scientific weekly, has nothing but praise for our work.

Dr Price begins by saying that 'in his early work as a psychic investigator, Soal published excellent papers reporting negative findings and showed himself to be a meticulous and ingenious experimenter, expert at uncovering trickery.' But every competent critic has admitted that the Shackleton experiments, for instance, were on a higher level of technical efficiency than any of the earlier 1924-1939 card-guessing experiments. In the earlier work, for example, the guesser and sender were in the same room separated only by a screen whereas elaborate precautions were taken in the later work to eliminate all sensory cues. Apparently Dr Price considers the early experiments to be 'excellent' merely because they produced only negative findings. In much the same way critics hostile to extra-sensory perception pronounced Coover's very defective experiments to be 'a notable example of painstaking, thorough research and exact treatment of numerical data.' There is little doubt that had Coover obtained positive results of high significance his experimental methods would have been described in far less flattering terms.

It is very significant and somewhat comforting to learn that Dr Price admits that 'most of Soal's work' cannot be accounted for by any combination of statistical artifact and sensory leakage. He is convinced, for instance, of the inadequacy of Rawcliffe's theory of 'double whispering' in disposing of the Shackleton results or of Mr Spencer Brown's suggestion that the extra-chance scores are due to non-randomness in the target series or to defects in probability theory.

He is therefore driven in the last resort to suggest that the experimenters have deliberately organized fraudulent techniques which have been successfully practised in the case of Mrs Stewart over a period of four years without detection by the numerous academic people who have taken part in the experiments. In taking this attitude Dr Price would appear to be trading on the prejudice and hostility which a majority of American scientists bear towards the subject of telepathy. In England the attitude of scientific men and philosophers is far more tolerant and open-minded, and such an attack as that of Dr Price would be considered grossly unfair unless he could produce actual evidence that cheating had taken place.

Dr Price has suggested several methods by which the experiments could have been faked. I propose to examine these suggestions in some detail.

In at least three of the procedures described the agent or sender and the percipient (as well as EA the principal experimenter) are in the trick. The agent, sitting behind the screen arranges the five animal cards in an order which has been decided beforehand by (EA) the principal experimenter. Or in another variation the agent lays out the cards in any order and communicates this order to (EA) on the other

side of the screen by means of some code concealed in a phrase such as 'I am now ready', etc. (EA) then communicates this order (or certain partial constituents of it) to the percipient in the next room by means of a code contained in some common-place phrase. The percipient who is in collusion with (EA) has previously memorized certain numbers chosen by (EA) from certain key positions of his list of random numbers. As (EA) calls aloud the serial numbers of the 25 guesses the percipient decodes the numbers in the key positions into the corresponding initials of the animals' names.

Dr Price goes to great length in devising variations on this theme but they all depend on the Agent being in collusion with the chief experimenter or with the percipient. Now four of the agents with whom Mrs Stewart was highly successful were lecturers of academic standing at Queen Mary College in the University of London. Two were senior lecturers and the other two mathematicians who had done distinguished creative work. A fifth agent who was brilliantly successful over a long period was a senior civil servant, in fact an assistant director of mathematical examinations in the Civil Service. Now it is plausible to suppose that I, as principal experimenter, could persuade any of these men to enter into a stupid and pointless collusion to fake the experiments over a period of years? What had any of them to gain from such deplorable conduct? Had I gone to any of them and suggested (as Dr Price recommends) that in a good cause a little deception would do no harm I know quite plainly that the result would have been a first-class scandal in University circles. These men had no burning desire to prove extra-sensory perception and no religious axes to grind. They had everything to lose by besmirching their academic reputations. Their only motive was scientific curiosity. It is idle therefore for Dr Price to assume that these five agents would consent to arrange the cards at the bidding of myself or deliberately to communicate the code either to myself or to the percipient, Mrs Stewart. Certainly you might find obscure people with no conscience who would, if they were paid for doing it, assist in faking an experiment, but not in the ranks of University lecturers.

If then, these agents were not in the trick, how did (EA) get hold of the code in order to communicate it to Mrs Stewart? Since in many such experiments another academic man was sitting by Mrs Stewart handing her numbered record sheets to fill in one by one, it would be clearly too late for her to receive the code *after* her 50 guesses had been completed. Nor could she draw prepared lists of guesses from a drawer since there was no accessible drawer at the table where she sat and even had there been one her every movement was under observation by the academic man sitting beside her. (EA) might of course *ask* the agent innocently for the order of the code at the commencement of each run of 50 guesses, but all the agents would swear emphatically that no such thing ever happened and that during a run (EA) never left his own side of the screen. Moreover, asking for the code would excite immediate suspicion. Dr Price has made the suggestion that

(EA) looking through the hole in the screen might see the reflection of the five cards in the agent's spectacles. But with the lighting of the room as it was and the position of the hole and the size of the box it can easily be verified that such a thing would be impossible. I have always been on guard against reflections in card experiments and as the main object of my set-up was to ensure that (EA) who gave the signals to Shackleton or Mrs Stewart should have no knowledge of what card the agent was looking at, I naturally took special precautions to see that reflections in spectacles, window panes, etc. were impossible. I am ready to demonstrate to anyone that the spectacles theory is an erroneous one under our particular conditions.

If then the agent is not in the trick it would appear to be impossible for the code to have been communicated to Mrs Stewart until she had recorded her guesses. I could cite large numbers of highly successful experiments in which both the agent and the person who sat with Mrs Stewart were people of academic standing. Let me give only two examples.

At sitting No. 52 on 23 April 1948, Dr Louise Morgan, a well-known journalist on the staff of the *News Chronicle*, visited us for the first time and took part as Agent. Dr Brendel of Queen Mary College sat by Mrs Stewart for the whole time while she was making her guesses. The checking of scores was done by Dr Brendel watched by Dr Morgan and a Mr R. A. M. Kearney, B.A., a mathematician. Mrs Stewart made a score of 109 hits in 400 guesses. This gives an excess over chance expectation of more than 3.5 standard deviations. Now no-one will suggest that I could be such a fool as to attempt a collusion with Dr Morgan. If I had done so I should have seen my name in letters of infamy in next morning's *News Chronicle*.

And here is an experiment in Pure Telepathy in which Mr Rozelaar of Queen Mary College was the agent. In this case no actual cards were used but the agent imagined a code to be printed on five blank pieces of paper and did not divulge it until Mrs Stewart's guess sheet was safely in the hands of Mr Bateman, M.Sc. (Assistant Director of Examinations to the Civil Service Commission) who sat by Mrs Stewart. On 200 trials she obtained 60 hits — the equivalent of 3.5 standard deviations. Here there was no question of (EA) (myself) reading the code in Rozelaar's glasses. (Actually at that time he did not wear spectacles.) And as I have said, it would be absurd to suppose that a Senior lecturer of London University would lower himself to assist in faking an experiment. Rozelaar had no connection whatever with any psychical organization. The guesses were decoded by Mr Bateman checked by Mrs Hales (a highly respectable professional pianist) and Mr Rozelaar himself checked me as I called aloud Mrs Stewart's guesses.

I could multiply examples of experiments of this kind.

Moreover, Mrs Stewart was successful with 15 agents out of 30 that were tried. Dr Price's assumption of collusion between myself and fellow lecturers of London University has no basis in reality and is a

fantastic product of his own imagination. Many people would consider such an hypothesis to be more improbable than the existence of telepathy itself, for which there is a vast amount of spontaneous evidence of good quality quite apart from card-guessing. Indeed, in formulating his themes of collusion Dr Price has not taken sufficiently into account the high quality of the personnel connected with these experiments. Nor has he any acquaintance with the mentalities of the percipients themselves. No-one, for instance, who knew Shackleton would credit him with the ability to memorize accurately certain random numbers located in varying key positions in as many as twelve or sixteen columns, and in addition to transpose these numbers into code letters at the rate of one every two seconds. I should experience the greatest difficulty in performing such a task myself even at the normal rate of calling while at the rapid rate of a call every second I should find the thing impossible. With an observer watching every movement I should be unable to pull from my pocket any lists with which to refresh my memory. And to have to carry out such a nerve-racking performance week after week would be intolerable.

Then again the reproduction of the many subtle position effects described in Chapter XIX of *Modern Experiments in Telepathy* would be very difficult to fake.

In certain of the Shackleton experiments the lists of random numbers were prepared by Dr Wassermann, a mathematical physicist, and I had no opportunity of seeing them until the experiment was over. Most people in England who know Dr Wassermann would have little doubt about the sort of reaction that would be induced in him by a request to assist in faking an experiment.

Dr Price evidently thinks that extra-sensory perception should be established once for all by an absolutely fraud-proof cast-iron experiment. The late Dr F. C. S. Schiller, the Oxford philosopher, used to argue that such a hope was illusory. Even were such an experiment feasible, we should find that as the years passed and the experiment faded into history fresh doubts would begin to be raised about the reliability of the experimenters or the possibilities of collusion. Another experiment would then be necessary, and the arguments would begin all over again. On this question I am in agreement with Schiller, and I favour a quite different method of approach.

The main obstacle to the acceptance of parapsychological phenomena is the apparent rarity of the people who can produce them under even reasonable conditions of control. Now this rarity I believe to be apparent rather than real. We do not know the signs by which to distinguish these exceptional card-guessers, and so we waste time and effort in testing the wrong kind of people. There is increasing reason to believe that we shall not discover them in University populations and that it is a waste of time to experiment with students. But experience of the last few months has indicated that it is among the less sophisticated types that we should prosecute our search—especially among children living in rural communities or in backward countries.

I think there is little doubt that with an increasing number of such high-scoring subjects much of the prejudice of ordinary scientific workers will disappear. When more and more competent experimenters report on cases of high-scoring subjects, the hypothesis of collusion will become as extinct as the dodo. For while it is, in the last resort, possible to suggest that two or three experimenters have faked their results, this will not be possible when scores of competent investigators produce their reports on similar cases. I suggest to Dr Price, therefore, that efforts should be directed towards the discovery of the personality characteristics of these people who make averages of 8 or 10 hits per 25 over considerable periods, the sort of communities in which they may be successfully found, and so on. In other words, we should aim at repeatability by more and more investigators.

NOTES ON THE CAMBRIDGE CONFERENCE ON SPONTANEOUS PHENOMENA

THE International Conference held at Newnham College, Cambridge, in July was the first occasion on which this Society has acted as host for such a Conference during the whole of its existence. It was convened in pursuance of recommendations made at the larger International Conference at Utrecht in 1953 with a view to reviving the study of the spontaneous phenomena of psychical research. The cost was generously borne by the Parapsychology Foundation of New York. It was very fortunate that it could be held in Newnham, a place with interesting historical associations for students of psychical research. The arrangements made by the College authorities for the accommodation of the delegates left nothing to be desired, and, the weather being fine throughout, the use of the beautiful garden was greatly appreciated. Apart from the much regretted absence of Mrs Eileen Garrett, the President of Honour, owing to illness, the Conference was a great success. Rather more than thirty delegates and observers attended from ten countries.

The Conference was planned as one to which comparatively few delegates should be invited, all being persons actively concerned with spontaneous cases, who could therefore discuss their problems with a freedom impossible in a larger body, and with better prospects of arriving at practical conclusions for the further promotion of this branch of our subject. For the same reason the press were not invited to report the proceedings. There are other occasions on which the Society would welcome the presence of representatives of the press, and would in fact be very glad if they would make better use of the opportunities so offered them.