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EDITORIAL

THE FIRST TEN YEARS OF THE JOURNAL

WITH THIS NUMBER ends the first decade of the JOURNAL OF PARAPSYCHOLOGY. Quite naturally the event leaves us in a mood for appraisal. Whether or not the JOURNAL has been a success in this initial period of trial will depend upon the viewpoint of the questioner. It has not been a financial success: as a matter of fact, it has operated each year with a deficit. However, no one had expected that it would "pay"; scientific periodicals of its type have never made money.

Again, the JOURNAL has not become widely read or "popular"; but in considering this fact, one must take into account the editorial aims. We have steadfastly resisted the temptation to lighten the contents of the periodical so as to make it more readable and interesting to a larger public. The first need has been, and still is, to keep a channel open for current research reports in their original completeness of detail. From these papers other less technical articles can be written to bring the results to a larger clientele. And it has happened in just that way. Science writers have liberally reviewed the reports in more popular language, and other professional writers have frequently drawn upon the material of the JOURNAL and given it wide circulation.

On the matter of "official recognition," we can boast of no distinguished success during this first decade. There are no formal

acknowledgments of its achievements and no overt recognition of its contributions to science. But again such show of honor was in no wise anticipated by anyone; and even now the day of appropriate recognition would be difficult to predict. So there is no feeling of disappointment or surprise at this lack of success.

We do, however, have good reason for gratification over what has been accomplished. First, there is the fact that our JOURNAL has survived its period of severest trial. The toughest possible time came during the war years and, in comparison with similar publications, the JOURNAL kept to its schedule and standards well. An experienced editor of another much older publication asked incredulously at the beginning, in 1937, how the editors ever expected to find material enough to fill such a journal. No one will ask such a question in 1947.

The chief source of satisfaction, however, is in *what* we have published in our first ten volumes. In these three thousand pages lies the main part of the story of the establishment of ESP, the greater portion of the more incontestable evidence. It was not a wholly peaceful story, for the first half of the decade overlapped the period of controversy over ESP; but it is a tale of sound achievement. After the distance tests of ESP in the late thirties, there followed the precognition work in the early forties. By 1943 the time was ripe for the series of PK reports to appear, and they have continued to run through every number since.

Several important peculiarities of psi phenomena have come to light during the ten-year period. Salience and the various other position effects, especially the QD's, have demonstrated such lawfulness as no other decade of parapsychology ever knew. Displacement has been established as a way by which ESP eludes the experimenter if he is not on the alert for it. Negativistic psi effects, or rejection of the target, have emerged likewise as a firmly planted development of the decade.

The last year has introduced the first systematic studies of personality in connection with ESP success. The success with which this new area of research has been opened up gives more than a hint that this branch will likely be in the lead through much of the decade ahead. Certainly we will be giving more attention to the

individual subject as a personality than we have done hitherto, with a view to understanding the place of psi capacities in the total scheme of man.

Telepathy, an almost forgotten phenomenon in the experimental laboratory during the decade, has recently been challenged again. The happy result has been that the interest of active research workers here and abroad has been captured, and the first report of a "pure telepathy" experiment designed to meet present-day requirements appears in this issue.

It has been a decade of groundwork, of the development of methods, and of the establishment of a few fundamentals. We are ready now to go on to a number of further problems and to branch out on new lines that had to wait for the basic researches of the past ten years. The inquiries in parapsychology should operate on an increasingly broad front to cope with the issues that now challenge investigation, and the next decade should be a still more interesting and fruitful one.

It is our hope that the readers of the JOURNAL will enjoy keeping up with the new advances as much as we will appreciate the opportunity to help in bringing them to the light of publication.

J. B. R.

AN EXPERIMENT IN PURE TELEPATHY

By Elizabeth A. McMahan

ABSTRACT: An ESP experiment was conducted in such a way as to allow telepathy to function, but not clairvoyance or precognition. The sender thought of one of the ESP symbols without making any objective record of it except through a code number, while the receiver in another room tried to identify the symbol. The code was communicated to an assistant experimenter by means of reference to common memories which had no objective basis and hence were inaccessible to clairvoyance. Significant results were obtained.

In one series, which was individually significant, each subject was asked to make a drawing after he had completed four runs with the ESP symbols. It was found that on the basis of the form quality of these drawings the subjects could be divided into high and low ESP scoring groups.

The experiment offers results that are at least difficult to account for unless by telepathy.—Ed.

THE QUESTION has recently been raised by J. B. Rhine (6) as to whether or not true telepathy is established as a form of ESP. The conclusion was reached that in spite of the bias which most people have, favoring telepathy over clairvoyance, the fact remains that clairvoyance, and precognition as well, have a sound experimental basis, while telepathy has not. All the "evidence" for telepathy may be accounted for either by clairvoyance or by a combination of clairvoyance and precognition.

The present doubt concerning the status of telepathy is not the first which has arisen in the history of parapsychology. Before 1930 no effort was made in any of the so-called telepathy experiments to eliminate the possibility of clairvoyance. It was not taken seriously as a counterhypothesis. When the experiments were finally questioned in 1930, a new pure telepathy technique was devised which seemed to rectify the inadequacies of the previous tests. The sender in the new tests did not write down the symbol he had in mind until after the subject had recorded his call. Since there was no objective record of the sender's thought in existence at the time that the call was made, clairvoyance was considered to be excluded. Investigators believed, when significant results were obtained with

the newly devised test, that the challenge offered by clairvoyance was answered and telepathy restored to its former status of an established phenomenon.

But now telepathy has again come up for reconsideration. With the establishment of precognition, it is seen that the old tests are not adequately controlled. They do not exclude the possibility that by precognitive clairvoyance the subject can acquire knowledge of the record the sender will make of his thought.

Before telepathy can regain its former position of security, new tests must be devised which rule out precognition as well as clairvoyance. The deficiencies of previous pure telepathy experiments have been reviewed in the already mentioned article by Dr. Rhine. The requirements of a pure telepathy test make the task of setting up an adequate one somewhat difficult. Not only must there be no objective record of the sender's thought at the time that the subject makes his call, but these thoughts must *never* have an objective record anywhere at any time. If a subject can do significant scoring under these conditions, then telepathy will be established.

Both Thouless (**7**, p. 49) and Rhine (**6**, p. 178; **7**, p. 49) have made suggestions regarding methods of testing for pure telepathy. Thouless has proposed the use of a list of random numbers from one to five, each number representing a different ESP symbol. Before the testing is begun, the experimenter thinks of a number from zero to four which he will add to the number in the list on a given trial. If the two numbers give a sum above five, five is subtracted. The experimenter then thinks of the symbol which corresponds to the sum (or difference). The added number must never be given objectively, and therefore the experiment cannot be checked by another person. This latter fact is the chief objection to the experiment, as Thouless points out.

Rhine has suggested a way of getting around the difficulty just mentioned. "The code number can be kept *subjective* and yet *shared* with an assistant by communicating it entirely in terms of common memories shared by the two—memories that never have had any objective expression or record. For example, if the number is five, the experimenter may say to the assistant, 'The number is that which characterizes the size of family you will think of first

when I mention carnations.' The assistant may confirm the number with a reply in kind, but with different reference" (7, p. 49).

The experimental series to be reported here were designed with these suggestions in mind.

General Description of the Procedure

The present experiment was begun on November 2, 1945, and since that time five series of tests have been completed. At the outset of each of the first four series a limit of 12 subjects was set, each subject to do four runs. At the beginning of the fifth series, the limit was set at 24 subjects, for reasons which will be explained later.

In all five series essentially the same experimental set-up and apparatus were used. The subject was seated at a table in one room (A) while the experimenter, who acted as sender, sat in another room (B) which was about 50 feet down the hall and was separated from A by two intervening rooms. The sender and the subject maintained contact by means of a signaling system involving lights. Each had a light and an electric contact key on the table before him. When the sender was ready to "send" an impression, she pressed her key, causing both her light and the light in the subject's room to go on. At this signal the subject recorded his call, after which he pressed the key in his room, turning off both lights. Since the sender could not turn the lights off, nor the subject turn them on, there was no danger of losing the place in the course of a run.

The method of determining what symbols should be sent involved the use of a code, following the procedure suggested by Rhine. To each of the five ESP symbols a different number (from one to five) was assigned, but this code was never to be objectified. By means of the method proposed by Rhine, as described earlier, I communicated the code to Dr. Betty M. Humphrey, who has rechecked all the data. Dr. Humphrey's part in this investigation was a most important one, as her recheck eliminates the possibility of personal errors by the experimenter and adds greatly to the present case for telepathy.

In order to save time in the course of the experiment and before

any testing was begun in Series I, the following preparations were made. A deck of 25 cards bearing numbers from one to five (five cards of each number) was shuffled and the order of the cards was recorded in the first column on a record page. The deck was then reshuffled and the new order recorded in the adjacent column. This was continued until four columns were filled on each of 12 target sheets. The same procedure was carried out for the other four series, with the exception that, in Series V, 24 sheets were prepared.

Because it was more convenient to send from cards than from the order written on the record sheet, decks of numbered cards were used in the actual testing, each deck having a different colored back. The cards in these decks were arranged so as to match the four columns of numbers on the prepared target sheet. The blue deck was always made to match the first run; the yellow deck, the second run; the green deck, the third run; the black deck, the fourth run. These decks, along with the prepared target sheets, were kept in the sender's room in the table drawer. (The sheets were numbered in sequence and for Series I, II, and III were used in order.)

At a typical session the subject was first taken into Room A where he was to be tested. Here the nature of the experiment and the signaling system were explained to him. He was then taken to the sender's room (B) and was told that here the experimenter would concentrate on ESP symbols which he was to attempt to guess. The numbered cards and their function were briefly explained. On returning to Room A the subject was asked to fill out a short personal data questionnaire which is customarily given to subjects prior to taking a test in the Parapsychology Laboratory. The results of this questionnaire are not used in the present study.

It was explained to the subject that four runs were to be done and that prizes of movie tickets and chances on a box of candy would be given for a good total score on the page. It was also explained that he could never be told his score for an individual run (because of the risk of giving away the code, thereby exposing the results to interpretation in terms of precognitive clairvoyance). Many of the subjects had been in previous GESP or clairvoyance experiments and were acquainted with the general procedure. Therefore it was necessary to describe briefly the use of the code and

why it was needed in order to show why the individual run scores could not be divulged. (In Series V the subjects were not told even their total scores. The reason for this exception will be explained later.)

When the testing was started, the experimenter closed the door to Room A, then went into Room B and closed its door. She took the blue deck of numbered cards, which was arranged to match the first column of code numbers on the first target sheet, and placed it face down before her. The cards were then in the proper sequence. She lifted the first card, looked at it, and placed it in a small cardboard container before her. She concentrated on the ESP symbol which corresponded to the number on the card, and pressed the signal key, turning on both lights. After a short interval in which the experimenter continued to think of the symbol, the light in her room would go out, signifying that the subject had recorded his inpression and had pressed his key. The experimenter then picked up the next card, concentrated on the symbol, and pressed the key again.

After completing a deck in this way, the experimenter picked up the target sheet (with the four columns of numbers corresponding to the four decks of cards) and went into Room A. Here she compared the subject's calls with the first column of numbers on the target sheet. Great care was taken at all times to be sure that no check mark or even a tiny gesture was made which might indicate which calls were hits. The chief reason for making the between-run check-up was to divide the session into smaller units, thereby relieving the monotony of continued testing. It was felt that the subjects' scores would benefit by such a procedure. Although the subject could not know except by telepathy what code was in use, the target sheet was kept beyond his view. After the first check-up the experimenter lightly praised the subject's score without in any way suggesting the number of hits made. She then returned to Room B, picked up the yellow numbered deck (which matched the second run on the target sheet) and proceeded as before. After every run, the experimenter subjectively checked the hits in the subject's room.

Regardless of the score on a run, the experimenter made ap-

proximately these comments: After the first run, she said, "That's fine! Now let's see how well you can do on the next one." After runs two and three, she said, "O.K.! Now for the next one"—or some such neutral remark. After the fourth run each subject was told his total score and was given a free coupon entitling him to a chance on a box of candy. Subjects who had obtained requisite scores were given other rewards as well. This ended a session.

The experimenter then took the record sheets and rechecked them carefully, recording only the total page score. Any variations from the procedure described above will be mentioned in the report of the results of each series.

Series I and II

While the foregoing description of a session is essentially true for all five series, each series was distinctive. Series I and II were particularly different from the others and may be discussed together.

Series I, from the subject's viewpoint, was a clairvoyance experiment, and the directions given above were changed appropriately. The subject was unaware of the fact that the experimenter was not only testing for clairvoyance but was attempting telepathic intrusion as well.

In this series two decks of cards were used in each run: a regular deck of ESP cards for the clairvoyance part of the test, and a deck of numbered cards for the telepathy, which was unknown to the subject. The subject's ostensible task was to identify the symbols on the ESP cards. In actuality the experimenter was interested in seeing whether she could cause the subject to score higher in the telepathy check-up of which he was not consciously aware.

The testing technique was very much like that already described except that the experimenter began by turning up a numbered card with one hand while removing the top card from the ESP deck with the other. The ESP deck was face-down, and the cards were kept in this same position so that they were never seen until the check-up at the end of the run.[1]

While concentrating on the symbol corresponding to the number

[1] It is realized, of course, that this was not a test for pure clairvoyance (that is, it did not insure against precognitive telepathy), but such a test was not intended.

in the telepathy deck, the experimenter pressed the key which turned on the lights, signaling that she was ready. When her light again went off, she looked at the next numbered card and slipped the second ESP card off its deck.

Since the subject thought he was being tested under the ordinary BT technique, the prizes were given only for scores on the clairvoyance runs. The hits for these runs were checked on the record sheet since no code was in danger of being given away. The subject watched the checking between runs, and therefore knew each run score. The telepathy runs were checked at the end of the session after the subject had gone, and only the page score was recorded.

After the limit of 12 subjects was reached, the scores were totaled with the following results:

Clairvoyance		Telepathy	
Runs	Total Dev.	Runs	Total Dev.
48	+31	48	−11
CR = 2.24		CR = .79	

The clairvoyance runs show an almost significant positive deviation, while the telepathy runs have an insignificant negative deviation. The effort at "intrusion" apparently did not succeed.

It was decided that the next step would be to use the same subjects in a similar experiment, but this time to call it a telepathy experiment and have the clairvoyance part a secret. In other words, the new experiment would reverse the arrangement of Series I insofar as the roles of clairvoyance and telepathy were concerned.

The directions given the subject in Series II, and the procedure, from his point of view, were identical with those described earlier for telepathy.

A new code was devised for this series and was communicated to Dr. Humphrey as before. Because of a rather long interval between the communicating of the code and the check-up, however, it was necessary to recommunicate the code. In order to save time, the code was given in terms of that used in the first series. For example, I would say, "*Square* in this code corresponds to the number which represented *circle* in Code No. 1." Therefore the using of two codes has no functional importance in this investigation.

The results of Series II are as follows:

Clairvoyance		Telepathy	
Runs	Total Dev.	Runs	Total Dev.
48	+16	48	+10
CR = 1.15		CR = .72	

When the results for both Series I and Series II are pooled, the clairvoyance runs have a significant deviation with a CR of 2.40:

Clairvoyance		Telepathy	
Runs	Total Dev.	Runs	Total Dev.
96	+47	96	−1
CR = 2.40			
P = .008			

It is well to remember that the same subjects were used in Series I and II. It is possible that the habits of Series I held over in Series II to some extent and caused the subjects to continue scoring higher for clairvoyance. At any rate, their pooled result did not show any evidence of telepathy, which was the problem of primary interest.

The subjects showed a consistency in scoring tendency, however, which deserves attention. A comparision of the scores for clairvoyance and telepathy for both series indicated that subjects scored better under a particular condition when they were aware of it than when they were not. Table 1 shows this tendency most clearly. Eight subjects, it will be seen, scored higher on clairvoyance in Series I than they did in Series II, as might be expected, while four scored lower. In Series II, which was supposed to be a telepathy test, eight subjects made higher scores on telepathy than they did in Series I where telepathy was secret; three made lower scores, and one made the same score in both series. It is remarkable, too, that the three "contrary" subjects in telepathy who scored lower in Series II were likewise contrary in clairvoyance. That is, their clairvoyance scores were higher in Series II than in Series I. Out of 24 cases, then, 16 showed the expected trend of scoring higher for the known condition, while only eight showed the opposite trend of scoring lower (or the same). Of these eight cases, six represent three subjects who showed the contrary tendency for both clairvoyance and telepathy. When the hypothesis is stated thus: regardless of the type of test presented, a subject tends to

Table 1

COMPARISON OF SCORES FOR KNOWN AND UNKNOWN CONDITIONS

Subjects	CLAIRVOYANCE	TELEPATHY
	Series I (known) compared with Series II (unknown)	Series II (known) compared with Series I (unknown)
1	Higher	Higher
2	Lower	Lower
3	Higher	Higher
4	Lower	Lower
5	Higher	Higher
6	Lower	Lower
7*	Higher	Same
8	Higher	Higher
9*	Lower	Higher
10	Higher	Higher
11	Higher	Higher
12	Higher	Higher

*These subjects are not consistent in their scoring trends.

be consistent in his scoring trend with respect to known and unknown conditions, only two subjects out of the 12 (those with asterisks) do not conform. These results, while not significant, suggest that telepathy was functioning in these series.

A new series was next planned in which telepathy *alone* would be tested.

SERIES III AND IV

All the subjects in Series III were different from those used in Series I and II. The code of the first series was employed again (as it was also in Series IV and V), and the experimental set-up was like that described under "General Description of Procedure."

The total deviation for Series III was +24, which gives a CR of 1.73.

Series IV was conducted under conditions almost identical with those of Series III. The experimental safeguards, however, were more rigid. Before this series was begun, a plan of procedure, along with duplicate numbered target sheets, was filed with the Laboratory Record Librarian. The 12 target sheets which had been filled out for Series IV were then thoroughly shuffled by a person other than Dr. Humphrey (since she knew the code) and

were renumbered to show the sequence in which they were to be used. This was done in order to eliminate the hypothesis that by precognitive clairvoyance I could have known the order of the calls made by individual subjects and could, by the psychic shuffle method, have matched the numbers (representing symbols) with the subjects' calls.

The subject kept a carbon copy of his calls which I never touched, and turned it in, at the end of the session, to the Record Librarian.

All the subjects, with the exception of one, were new.

The series proved to be a negative one with a minus deviation of 27. This gives a CR of 1.95.

Series V

The most important single series in the group is Series V. The more rigid experimental safeguards used in Series IV were observed in Series V as well.

The previous series had shown evidence of personality differences in scoring which were interesting. Since studies concerning the relationship of subjects' personalities to their rates of scoring were being carried out at the Parapsychology Laboratory by Dr. Humphrey and Dr. C. E. Stuart, it was decided to utilize some of their methods and findings in the plan of Series V.

The technique in use by Humphrey has been described in detail in two articles in recent issues of the Journal (3, 4). Essentially, it consists of classifying subjects, on the basis of the form quality of the drawings they make in ESP tests, into expansive and compressive subjects.[2] It has been found that this classification separates the high and low ESP scorers.

At about the same time that Series III and IV were carried out, Mr. Burke M. Smith was making a series of classroom tests designed to find out if the expansion-compression in subjects' drawings separated into high and low groups the scores on ESP card runs made in the same session. A report of these tests will be found on page 269 in this issue of the Journal. The testing involved the clairvoyance technique. Besides the ESP card tests there were

[2] Humphrey has used a method of appraising the form quality of drawings which was devised by Dr. Paula Elkisch (2).

tests in which the subjects made two drawings each in their attempts to reproduce target pictures by ESP. From these drawings the subjects, all of whom were men, were rated as expansive or compressive. They were also given the Maslow Security-Insecurity Questionnaire (5). With this additional information about these individuals, it was decided to use some of them as subjects in the next telepathy series.

The plan of Series V was as follows: The subjects were to be selected on the basis of three classifications: their ESP scores, the expansion-compression ratings they received on their drawings, and their ratings on the Maslow tests. In one group were to be placed only those individuals who had high ESP scores in the classroom test, who were expansive, and who were secure. The second group was to consist of those individuals who had made low ESP scores, who were compressive, and who were insecure.[3]

Instead of the usual 12 subjects, 24 were used in Series V so that more data would be available for comparison of the performance of the two groups.

Dr. Humphrey selected the subjects on the basis of the Smith records and placed them in the two groups (called for convenience "expansive" and "compressive"). Since I was experimenter and sender, I was not told which subjects were in which category, because such knowledge could conceivably influence my treatment of the subjects and hence their scores.

All the subjects who were asked to come did so, generously, although it involved some little trouble to come to the place of testing. Because of this difficulty, each one was given a movie ticket regardless of his total score. The specific scores or score total were never revealed, but the subject was always told that he had earned a ticket.

The experimental procedure varied in another way from that in previous series. After the runs with the symbols, the subject was asked to make one drawing in response to a picture which the

[3] Because of an insufficient number of subjects to choose from, two compressive, insecure subjects had to be used whose clairvoyance scores were exactly chance. For the same reason, it was necessary to include two subjects in the expansive group who were judged expansive in only one section of the Smith-Humphrey series, whereas all other subjects in this group had received expansive ratings in both sections of the experiment.

sender in Room B was thinking of. This trial was introduced so as to provide drawing material from the same session as the telepathy tests with symbols for use in rating the subjects as expansive or compressive. In order to make this drawing test comparable to the rest of the experiment in the minds of the subjects, it was presented as another test of pure telepathy, though it does not meet all the requirements. Briefly, the sender determined which of five previously selected numbered pictures would be the target by adding a subjective code number (Thouless' method) to the number uppermost on a die face. The pictures had been memorized and were not looked at during the test. When the drawings were later judged according to the preferential matching method, it was necessary to circle the hits on the judging sheet, rendering the test open to precognitive clairvoyance. The ESP scoring on this part of the test was insignificant, but, as already explained, the main function of the drawings was for purposes of classifying subjects as expansive or compressive. The data were not analyzed for expansive-secure and compressive-insecure results until after the completion of the series. The subjects were first grouped by Dr. Humphrey into the two original categories based on their previous test performance, after which the total telepathy scores for these two groups were calculated.

The 12 originally expansive-secure subjects gave a total deviation of −8 on the 48 runs, and the 12 compressive-insecure subjects gave a total deviation of +33. The CR of the difference between the two is 2.09 with a suggestive probability of .018.

In her personality studies, Dr. Humphrey has found that subjects are not permanently expansive or compressive. It seemed probable that some subjects in the present experiment had changed in this respect from their original classification. It had been with this possibility in mind that the additional drawing tests had been given in Series V. When the 24 subjects were reclassified by Dr. Humphrey as expansive or compressive on the basis of the drawings they had made at the end of the telepathy session, there were nine expansive subjects and 15 compressive subjects.

Dr. Humphrey had no information except the drawings themselves on which to base her classification. The names of the sub-

jects were not even attached to the drawings so that she could not have been influenced by knowledge of their previous classification.

The total scores for the two groups were as follows:

Expansive			Compressive	
Runs	Total Dev.		Runs	Total Dev.
36	−15		60	+40

$CR_d = 2.57$

The CR of the difference of 2.57 is significant, with a P of .005. The score for the compressive subjects alone is significant, with a CR of 2.58.

But the original separation of the two groups had been on the basis of the combination of ESP scores, expansion-compression and security-insecurity ratings. The new E-C ratings were therefore combined with the S-I ratings to get the E-S and C-I groupings. This eliminated seven subjects who shifted their E-C rating in the Series V drawing test. The resulting division is shown below:

Expansive-Secure			Compressive-Insecure	
Runs	Total Dev.		Runs	Total Dev.
28	−14		40	+34

$CR_d = 2.74$

This grouping of the subjects gives a significant CR of the difference of 2.74 with P = .003.

In the telepathy test the two groups of subjects completely reversed the scoring tendencies they had shown in the earlier clairvoyance test which Smith gave them so that now the compressive subjects scored significantly positively, and the expansive subjects were negative. Why such a change should take place is still a matter for research. These results, however, are in line with those found by Humphrey (4, pp. 187-88). She discovered that in Stuart's GESP tests in which the sender looked at the symbol he was sending, the compressive subjects made significantly higher scores than did the expansive ones. The opposite relationship was true in clairvoyance tests in which no one knew the card order.

It is evident that a pure telepathy test is more like one of GESP than it is like a clairvoyance test; and it is important to remember that the GESP test is presented to the subject as a telepathy test. The present finding, then, of a reversal of scoring trend for ex-

pansive and compressive subjects when tested under the two conditions of clairvoyance and telepathy was predictable on the basis of Dr. Humphrey's work.

Even the seven subjects who were omitted from one of the analyses because they changed from expansive to compressive or vice versa are not inconsistent cases. Five originally expansive subjects (with high clairvoyance scores) became compressive in the telepathy test, while two compressive subjects (with low clairvoyance scores) became expansive. On the basis of the rest of the results, we should expect the subjects who became compressive in the telepathy situation to score higher than did those who became expansive. This was actually the case as the figures below show:

E to C		C to E	
Runs	Total Dev.	Runs	Total Dev.
20	+6	8	−1

These results, then, are in line with the general findings.

General Results

Total Deviations

In all the series except Series V the objective of the experiment was the total deviations. The interest in Series V, however, lay in the *difference* in deviation between the two groups of subjects used.

Table 2 shows the CR's of the results of primary interest for each series. A chi-square combination of these CR's gives a chi-square of 15.4455, which is significant, with a probability of .01.

Table 2

Total Results by Series

Series	Runs	Dev.	CR	x^2
I	48	−11	.79	.6241
II	48	+10	.72	.5184
III	48	+24	1.73	2.9929
IV	48	−27	1.95	3.8025
V (Expan.-Secure)	28	−14	CR_d = 2.74	7.5076
V (Compr.-Insecure)	40	+34		
Total	260	+16		15.4455 P = .01

The deviations used for Series V are those obtained from the last analysis which separated the secure, expansive subjects from the insecure, compressive subjects on the basis of the drawings made in the telepathy situation.

Another fact of interest is that out of the total of 72 subjects in the five series together, five obtained page scores which had individually significant CR's of 2.50 or higher. Only one such score would be expected in over a hundred subjects. The P here is .001.

An analysis for the quarter distribution of hits on the page was made for both the clairvoyance and the telepathy data. The results of the analysis, however, will be left for a future report.

Discussion

Counterhypotheses

Before the results of this experiment can be regarded as evidence of ESP, the counterhypotheses of chance, sensory cues, and recording errors must be met. All the record sheets are accounted for. The experimental set-up, together with the fact that the data have been rechecked by Dr. Humphrey, adequately eliminates all the counterhypotheses except chance. Let us now consider the evidence against the chance hypothesis.

Series V, one of the most rigorously safeguarded against error, gave significant results alone. The difference found between the two groups of subjects is in the direction predicted from previous GESP experiments, and therefore the probability of .003 need not be corrected.

When the CR's for all the five series are combined by the chi-square method of evaluation, the resulting probability is .01.

It seems safe to conclude, therefore, that ESP has been established as present in the experiment, and the question may now be considered whether the precautions against precognitive clairvoyance were adequate for deciding whether or not telepathy is the best explanation for the results.

Possible Weaknesses of the Set-Up

There are two possible weaknesses in the telepathy set-up as employed in the present experiment. In the first place, the method by which the code was communicated to Dr. Humphrey may have

provided a loop-hole through which logic plus precognitive clairvoyance could have entered as an alternative explanation. In every case, however, Dr. Humphrey and I tried to anticipate and avoid factors which would make code-cracking a possibility. It would seem rather far-fetched to suppose that "cocoanut cream pie," for example, could directly signify the number 3 to anyone other than the two of us concerned. Nor does it seem likely that this number could be logically deduced by another person with the aid of precognitive clairvoyance even though the code description should be overheard. There have certainly been many cocoanut cream pies in many people's lives. Its significance for the two of us is, we think, wholly subjective. (This particular example was not one used in the actual communication of the code.)

The second weakness of the telepathy set-up is the possibility that the code could have been given away by the writing-down of hit totals on the record page and in the QD analyses. In order to make this decoding hypothesis more unlikely, the hits were never totaled for a single run, but rather for the entire page of four runs. In the QD analyses the hits were added for a single quarter for an entire series before any figure was written down. The carrying-out of the QD analysis on the individual series necessitated the omission of the thirteenth trial in every run. This resulted in there being approximately two runs per series for which the total was known.

The two weaknesses outlined cannot be taken seriously unless we assume very great calculative powers on the part of the subjects. They would have had to master a code which could not be solved without subjecting the data to a great deal of mathematical treatment. As Broad has pointed out (1, p. 23), we have no right to attribute to a person in an ESP test powers (beyond ESP) which he does not have on ordinary occasions. It seems unlikely that a person who has not the slightest conscious desire to figure out a code (and would scarcely know how to go about it even if he should be handed all the necessary data, together with paper and pencil) should nevertheless accomplish this mathematical feat and obtain his results by clairvoyance.

As far as I am able to judge, this investigation at least comes

closer to providing conditions needed for proving telepathy than has any previous experiment. How close it actually comes, the reader must decide for himself.

Clairvoyance

The clairvoyance tests of Series I and II, as explained previously, were carried out primarily for comparative purposes and were of secondary interest to the telepathy tests. They did incidentally produce a significantly positive total deviation ($P = .008$). The results most probably can be interpreted as evidence of pure clairvoyance, although this cannot be concluded with finality since precognitive telepathy is a possibility. The clairvoyance tests were of more importance in another way: they gave assurance at the beginning that ESP could function under the particular experimental conditions, and afforded encouragement to proceed with the later telepathy tests under the same conditions.

Intrusion

Perhaps a word should be said regarding the intrusion aspect of Series I and II. Nothing conclusive was shown, but some suggestions may possibly be gained from it for future experimentation. The handling of such an experiment may have been too much for one person to attempt; and this may account for the apparent failure. That is, the "intruding" sender may have been too preoccupied with the test procedure involved in handling the cards in the clairvoyance aspect of the tests. Perhaps two senders would be better, one known and the other "secret." Or an attempt might be made with better prospect of success when the experimenter is more experienced and more free from distraction due to the complexities of procedure.

Negative Series

Series IV is interesting because of its large negative deviation. Why the subjects in this series should score low is not clear. Perhaps they were predominantly "expansive," as measured by the Humphrey-Elkisch test, a possibility which we cannot ascertain because no drawings were made in the course of a session. Perhaps I, as sender, was in a particular state of mind which prevented the

subjects from gaining access to my thoughts. I must admit that after the first two subjects (whose deviations totalled −13) I found the thought recurring that if low scores were to continue at that rate, the results would be extremely interesting and significant. As it was, seven of the twelve subjects were negative, four were positive, and one scored at chance. The CR of the total deviation is 1.95, with a suggestive probability of .03. We are accustomed now to the well-established fact that psi capacities, being unconscious, are readily reversed in direction, and the same ability may give plus scores in one test and minus in another.

Bearing on GESP

The results of the present investigation bear upon the interpretation of previous experiments. In GESP tests there has always been the question of whether the results were due to clairvoyance or to telepathy, and recently the role of telepathy has been questioned altogether. The present work, with its evidence for telepathy, appears to throw some light on the issue.

The scoring trends of the expansive and the compressive subjects in the telepathy tests of Series V were identical with those in GESP drawing tests. That is, the compressive subjects made high scores while the expansive subjects made low scores. As Dr. Stuart has pointed out in conversation, the agreement of the telepathy results with those of GESP in the expansion-compression relationship suggests that it was telepathy that functioned in his GESP tests, as the subjects themselves were led to believe.

Conclusions

What conclusions are to be drawn on the basis of present knowledge regarding the occurrence of telepathy? The answer depends upon the adequacy of the experimental set-up in excluding precognitive clairvoyance. The method of testing described in this paper appears to furnish the best evidence for telepathy obtained thus far.

Parapsychological history reminds us that today's judgments must often be recalled tomorrow, and the future may conceivably alter again our basis for distinguishing telepathy and clairvoyance. The present investigation, however, is at least an encouraging be-

ginning, and, as far as our present knowledge is concerned, it seems to offer evidence of true telepathy.

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LAWFULNESS OF POSITION EFFECTS IN THE GIBSON CUP PK SERIES

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ABSTRACT: A large series of PK record sheets from a dice-throwing experiment were analyzed to find the way in which the hits were distributed in the sets. The set consisted of a block of ten columns of six entries each. The aim was to find any peculiarities in the hit distribution attributable to psychological factors. Three main findings are reported here: First, there was a striking decline from the first trial to the last (sixth) in the first column of the set. On the other hand, the rest of the nine columns of the set gave an incline, which was especially pronounced in the tenth. There are highly significant differences involved. Second, the sets on the left-hand side of the page gave the more marked position effects, particularly in the first column and in the witnessed sets. Third, the characteristic pattern of hit distribution was found to extend chronologically throughout the entire experiment and to exist even in the sets which scored below "chance." In general, the order of lawful relation shown probably exceeds anything thus far obtained in the analysis of psi data. The consistency of the subject's response to the structure of the set and page and the effect of variation in test conditions are discussed.—Ed.

Introduction

Position effects in PK tests have been studied heretofore chiefly as evidence that psychokinesis does occur. The investigators who discovered and reported this type of evidence were aware of the importance of position effects as a potential source of valuable information on how PK functions, but they were faced with the necessity of first answering the primary question: Does PK occur? Under the circumstances, they naturally and wisely chose to present the data in the manner which most effectively showed their significance as *evidence for PK*.

The method which they developed was ideally suited to their purpose. It had two chief advantages. The quarter distribution, or QD, analysis combined in one measure two modes of score decline, the horizontal and the vertical, which were found to be present in most PK records. Also, it provided a common denominator by which the data from many experiments could be compared and

assessed as a whole, in spite of differences in the exact form in which the records of different series had been kept.

How the evidence for PK from position effects supplements that obtained from the more usual methods of evaluating subjects' scores is already on record. Almost all of the thirty-one experimental reports on PK which have appeared in this JOURNAL since March, 1943, have contained position effect evidence, and the report of work done at the A.S.P.R. contains confirmatory evidence of this type (1). The full significance of the scoring trends running through eighteen separate experimental series is best seen in three summarizing articles which present the data in terms of the QD's of the page (6), the set (7), and the half-set (8). In the opinion of the investigators, these findings justify the conclusion that PK may be accepted, once and for all, as an established scientific phenomenon. This is clear from the closing sentence in the third article of the series cited above: "Merely to repeat PK tests with the simple objective of finding more evidence of the PK effect itself should be, from now on, an unthinkable waste of time for all those who could achieve the higher purpose [of helping to explain it]."

Questions are raised repeatedly in the PK reports which point to the need of making further studies of position effects as psychological phenomena. When analyses of data are planned with the psychological significance of salience as the main question, it seems advisable to study the distribution of scoring in the fine structure of the record, the individual trial, and to trace the position effects throughout the set or page in different subdivisions or groupings of the data. In this way it should be possible to isolate for further investigation the factors which produce these results. The present article reports the results obtained when such detailed analyses of position effects were made upon the work of L.H.G., the major subject in the Gibson Cup Series of PK tests.

THE DATA AND THE TECHNIQUE

The general description of the Gibson Cup Series and the evaluation of the total results was presented by Gibson, Gibson, and Rhine (2). In a companion article Humphrey and Rhine presented

the first analysis of position effects in this entire series (4). Each report contained evidence which led to the conclusion that PK had been demonstrated.

L.H.G.'s work in this experimental series falls logically into two groups, one in which her die throws were witnessed and the results recorded by her husband, E.P.G., and another in which she worked entirely alone and did her own recording. Under the witnessed condition she made 104,184 die throws, or 4,341 runs of 24 dice, which gave the deviation of target faces from mean chance expectation of +738, or 4.17 hits per run where 4.00 is the expected chance average. Working without a witness, she made 54,720 die throws, or 2,280 runs, with the deviation of +996, an average of 4.44 per run. The CR of the witnessed work is 6.14, and that of the unwitnessed is 11.43, so the data are clearly significant in general level of scoring.[1]

In this experiment, each trial consisted of the throwing of six dice at a time from a cylindrical cardboard cup onto a blanketed surface. The target face was always specified in advance. The number of target faces which came up on each throw of the six dice was recorded, and the results of six successive trials were entered on the data sheet in a short column. Before the subject started on another column, the hits for the six trials were totaled and the sum was entered directly below the scores. The second column was recorded parallel to and right beside the first one. This procedure was repeated until ten columns or 60 trials (360 die throws, or 15 runs) were completed. At this point the experiment was interrupted while the scores on the ten columns (that is, the *set*) were added and the total was recorded in the center under all ten columns. The same target was used throughout a set, with the negligible exception of five sets in the witnessed section in which the targets were changed after 20 or 30 trials.

The first set on the page was located in the upper left-hand corner of the record page, and the second one was placed just beside

[1] The data cited are those of L.H.G. summarized in the original report. Of these, all are used in the present study except a small batch of 270 runs with a deviation of +35 which were made under special conditions to compare working in red and white light, and one incomplete set consisting of six runs with a —1 deviation. The 276 runs which are omitted here for the sake of uniformity of conditions are all from the witnessed section.

it on the right-hand side of the page. If other sets were done in the same session, as was usually the case, they came directly below these with odd-numbered ones on the left and even-numbered ones on the right. The record sheets contained from one to eight sets, with four being the most frequent number. The unequal number of sets on the page results from the facts that the sessions were of unequal length and that a new page was used at the start of each one.

Only one record page, which happens to belong to the witnessed section, had only one set. This page has been chosen for reproduction in Figure 1 to show the form in which the data were kept. Thus there will be no mistaking what is meant by a "set" in these data. The chronological order of sets on the fuller pages is also shown. On the few sheets having eight sets, the data were recorded in a more compact manner than on the more typical page.

The original study of position effects in L.H.G.'s scores resulted in the discovery of two highly significant effects. One was a strikingly high rate of success in the end positions of the column, the first and the sixth trials, when all her data from both sections were combined to arrive at the composite column. The other was the high rate of scoring in the first column in comparison with every other column in the set when the composite horizontal distribution of the ten column-totals was obtained. In addition to these main position effects, the quarter distribution of hits for the page, the set, and the half-set were studied, and they were found to show a general decline in scoring between the upper left and the lower right quarters.

At the time the present research was being planned, considerable thought was given to the practical problem of finding an efficient procedure for summarizing the data. Former studies of position effects were made by tallying the distribution of hits directly from the original record sheets. Convenience in handling the data for the present analyses was greatly increased by copying each set of L.H.G.'s work on a strip of paper by means of a printing adding machine. This made it possible to sort the sets subsequently in any manner desired and to lay those within each of the different groups to be compared side by side for a count of hits in each of

Subject Lottie Gibson Observer E.P.G.

Date Sept. 14, 1925 Witnesses

Time 10:00 P.M.

General conditions Throwing 6 Dice

Use other side for remarks. Total score Avge. score

Throwing for Ones

1		2		3		4		5		6		7		8		9		10	
Call	Card	Call	Card	Call	Card	Call	Card	Call	Card	Call	Card	Call	Card	Call	Card	Call	Card	Call	Card
2	3	2	0	1	2	2	2	2	0										
1	2	0	0	1	3	0	3	0	0										
2	0	0	0	1	2	2	1	1	2			[Position of second set]							
0	1	3	2	1	3	1	0	2	1										
1	2	1	0	0	2	0	1	0	1										
1	2	2	2	2	1	0	0	0	1										
7	10	8	4	6	13	5	7	5	5										
				70															
		[Position of third set]										[Position of fourth set]							
		[Position of fifth set]										[Position of sixth set]							

FIG. 1. Copy of L.H.G.'s record sheet which contained a single witnessed set, with the positions of successive sets on the fuller pages indicated.

the 60 trial positions. This procedure also enabled the investigator to keep a constant check upon the accuracy of his work at every step in the long process of compiling the data and computing the results. The totals of the present analyses check in every instance with those of earlier reports. All computations in this paper have been independently made by two persons, and the accuracy of the completed graphs has been carefully verified.

Results and Discussion

The results are presented in the form of bar graphs which show the average scores per run in different trial positions within the set. To conserve space, the graph for each column has been made only as wide as necessary to accommodate the span of averages involved, and the bars are shown with a broken-out section between the zero base line and the first significant average line. The significance of the graphs, of course, rests entirely upon the right-hand ends of the bars, which show the averages for different trial positions in the set. The basic data for each graph have been prepared in tabular form and they will be sent to anyone who may wish them for purposes of further study of position effects in L.H.G.'s results.

Position Effects in the Work as a Whole

The comparison of the rate of scoring for the 60 trial positions of the composite witnessed set and the composite unwitnessed set are shown in Figure 2. The graph has been drawn to show the position effects in direct spatial relationship to the structure of the sets. The hits in each trial position have been reduced to an average score per 24 dice, the usual run in PK data. It is obvious, of course, that the run in this case does not represent consecutive die throws and that it has no relation to the procedure followed in the original experiment, as it takes four sets combined to give a run in each trial position in a single column.

Several significant relationships are shown by Figure 2. The high rate of scoring in the first column of the set, which was found in earlier analyses to be significantly higher than that in each of the other nine columns, results largely from the exceedingly favorable scoring on the first trials in the set. In the witnessed section of the graph, where each average is based upon 67.75 runs, the very

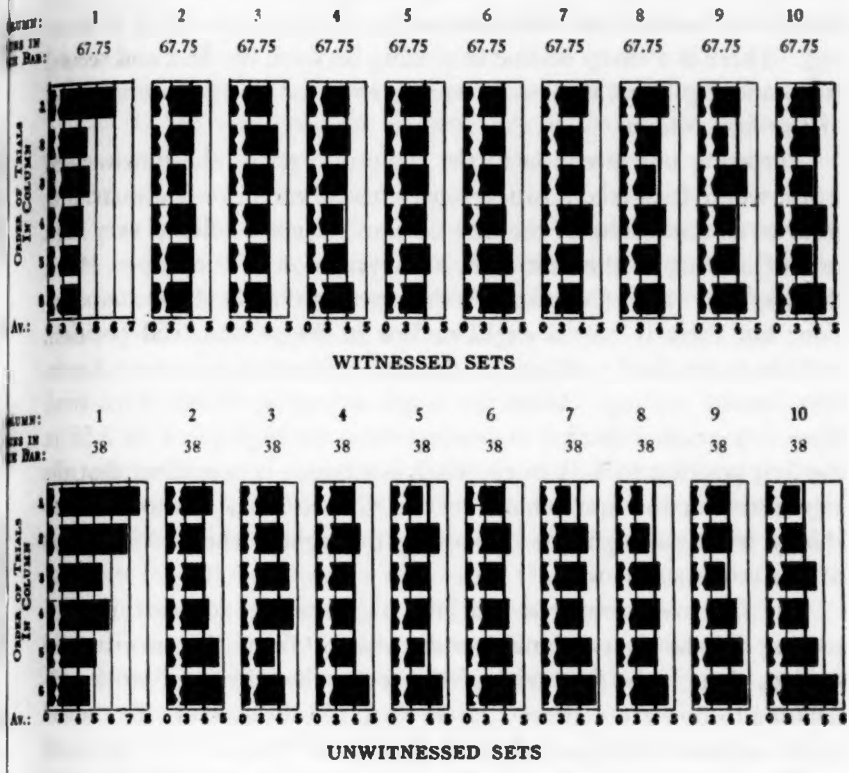


FIG. 2. Composite sets showing position effects in the witnessed and in the unwitnessed data in terms of average per run of 24 dice for each of the 60 trial positions of the set.

first trial in the set makes an outstanding contribution to the higher average of the first column. This first trial of the set is significantly better than every other trial in the set, with a CR of 4.61 for the difference between it and its nearest competitor, the third trial in the set.[2] In comparison with the very first trial, however, the rest of

[2] The data in this paper have already been demonstrated to be statistically significant. I realize that under these circumstances it would be preferable, other things being equal, to base all evaluations of differences between samples upon the observed variance in the scores. However, experience has shown that in actual practice the probability figures arrived at by the use of the observed variance approximate quite closely those obtained from the use of the theoretical binomial situation, which involves the assumption that the scores are normally distributed. As the work required in using the observed variance for so many comparisons and for such large batches of data would be prohibitive, and as the only definite conclusions reached in this report are based upon CR's which are clearly not of marginal significance, I have preferred to use the theoretical basis of statistical evaluation.

the first column of the witnessed section is not outstanding in scoring. There is a sharp decline in scoring between the first and second trials and a gradual decline in scoring over the five remaining trials of the first column.

Directing our attention to the composite set of the unwitnessed work, where each trial position represents 38 runs, we find a striking contrast in the results of the first column. Here we find a very high rate of scoring in the first trial, an average of 7.58 hits per 24 die throws, or a rate of scoring which is nearly double chance expectation; but there is only a slight decline in the second trial position, and the other four positions in the first column show a very favorable rate of scoring. With the single exception of the third trial, there is a gradual decline in scoring from the high point of 7.58 in the first position to 4.71 in the sixth position. It is evident that the superiority of the first column in L.H.G.'s work as a whole derives chiefly from the high rate of scoring throughout the first six trials of the unwitnessed work.[3]

So far, we have seen that the significantly superior rate of scoring in the first column results chiefly from the unwitnessed section, though the first trial of the set in the witnessed work contributed to this gross effect. How, then, did the second effect noted by Humphrey and Rhine, the standing-out of the first and the sixth positions in the single, composite column for all of L.H.G.'s trials, originate?

It is easy to see that the first position of their all-inclusive column was heavily weighted by the first trial of the set in both the witnessed and the unwitnessed work. In fact, these two trials alone are enough to account for the high average score which they reported for this position of L.H.G.'s "grand total" column. But they found the most favorable position in the column to be the

[3] It may be said at once that this high rate of scoring in the first trials cannot be explained on the hypothesis that the investigators selected a favorable throw of the six dice as the starting-point in putting down the record of the results. This hypothesis is plausible only in the case of the witnessed work, for it could not account for the significant scoring in the remaining trials of the column which the unwitnessed trials produced; yet the witnessed condition is precisely where this sort of error would be unlikely to occur. Furthermore, there is no point in advancing a hypothesis to explain the scoring of the first column alone, for there are highly significant relations in the other parts of the set. Moreover, any counterhypothesis would have to apply to all the independent series in which significant hit patterning has been discovered.

sixth or bottom one, and it is not nearly so evident at first glance how this result is derived. However, their observation was perfectly correct for their manner of pooling the data: the high rate of scoring in the end position resulted largely from adding together the comparatively high averages obtained on the last trials of *all ten columns in the unwitnessed work*. It is clear, therefore, that their two outstanding scoring positions in the column are not to be taken as characteristic of individual columns in the set. In fact, we may look closely at these graphs without finding any columns which clearly show both beginning and ending salience.

Characterizing the two sections of the data in terms of scoring trends in the different parts of the set, we find that the first columns of the set in both sections show a marked decline in scoring, with the witnessed work showing a lower average in each trial position than that found in the same trial position of the unwitnessed section. The middle columns of the sets for both sections, the second through the ninth, seem, in each case, to fit into a pattern that is very different for the witnessed and the unwitnessed work but which shows no striking column-to-column differences within each section. The middle-column pattern for the unwitnessed work is a gradual incline in scoring through the column, starting from approximately the chance average of four hits per 24 dice in the first position and increasing to a significant level of scoring in the last position. These averages for the combined eight middle columns of the unwitnessed work, with each figure based upon 304 runs, are, for positions one to six respectively, 3.91, 4.21, 4.15, 4.23, 4.27, and 4.70. With the slight exception presented by the third figure, this is a regular incline in rate of scoring. Also, it is a highly significant rise, as there is a difference of .79 in average between the first and last trials. The SD is .148, making the CR of the difference 5.34. This figure is so large and the effect is so regular throughout the separate columns that we may dismiss the possibility that I have simply singled out for emphasis here the most striking difference among several possible ones which as a whole could be attributed to chance variations.

The eight middle columns of the witnessed work do not show any trend which is marked enough to be evident from a casual in-

spection. When they are combined, however, the composite middle column, which has 542 runs in each trial position, has an average level of scoring which is slightly above chance in every position, with the first and last trials being sufficiently above the other four to suggest strongly the presence of both beginning and ending salience. The six position averages, in order, are: 4.25, 4.04, 4.06, 4.11, 4.12, and 4.20. It is evident, in the first place, that there is no difference of any significance between the first and the last positions, such as was found in the unwitnessed data. In view of the frequency with which beginning and ending salience have both been found in work where one is present, it seems justifiable, in attempting to arrive at a tentative judgment of whether terminal salience is a real effect in these middle columns of the witnessed sets, to evaluate the difference of .14 in average between the two end positions (1,084 runs) and the middle four trials (2,168 runs). The SD is .068 and the CR, 2.06, which is below the level of significance ($P = .02$), but it suggests that the beginning and ending salience of the middle columns of the witnessed section may not be of random origin.

The tenth column of each section has been left for separate consideration because of the fact that it marks the end of the set, a much more definite structural aspect of the record sheet than the ends of the middle columns. In other words, not only does the last column have importance as a column, with distinct beginning and ending positions, but it may also take on special meaning as the end of the set as a whole. The very last trial of the set is logically comparable to the first one, and it is not surprising to find that this one trial is the most outstanding in scoring average among the ten bottom positions of all the columns. A glance at the tenth column in each set of Figure 2 shows that the unwitnessed section gave striking evidence of stronger ending salience in the very last trial of the set. The average in that position is 5.66 as compared with 4.92 at the end of the second column, which took second honors, and 4.29 in the third column, which gave the lowest average. The ending salience of the set is not so clearly evident in the witnessed results. There the average in the end position of the last column is 4.49, which is bettered by an average of 4.56 at the bottom of the

sixth column. To have the end position of the last column show a marked superiority over the nine others in the unwitnessed section and to have it take second place in the witnessed results does, however, give force to the suggestion that the very last trial in the set, like the first one, is especially favored, once as the end of a column and again as the end of the set.

Without making any effort to establish conclusively an ending salience effect for the set as a whole, we may say that the suggestion of such a factor is strong enough to justify our keeping the tenth column separate in later analyses to see if any further light is shed upon this question. Likewise there can be no doubt, from the results of both the witnessed and the unwitnessed work, that there are special position effects present in the first column of the set, so this should clearly be kept as a distinct unit throughout any further study of these data. There is not discernible, in either the witnessed or the unwitnessed work, any consistent column-to-column differences among the middle eight columns, so these may be pooled in later analyses without danger of obscuring any of the factors which contribute to the production of position effects. The marked differences between the position effects of the witnessed and of the unwitnessed work emphasize the necessity of continuing to keep the two sections separate in all analyses.

To summarize briefly the position effects which have come to light in this first, general analysis of L.H.G.'s data: (1) Both sections have shown scoring in the first column which is significantly higher than that in the rest of the set. In the witnessed section, this is particularly true of the first trial of the set, while in the unwitnessed section the first two trials stand out above the others. There is evident in both sections a marked *decline* of scoring in the first column. (2) The eight middle columns of the unwitnessed section show a consistent *incline* in scoring, starting at "chance" in the first position of the column and rising to a highly significant level of scoring in the last position. (3) In the witnessed work, the middle columns taken separately do not establish any consistent trend of scoring, but when they are combined they give a suggestive effect of salience of both the beginning and the ending positions. (4) The tenth column in each section follows the general pattern

of the middle columns for the same condition, with the suggestion of an additional factor of salience in the end position of the column due to the fact that this is also the end of the set.

Position Effects in the Different Sets on the Page

There are 63 record sheets of witnessed tests, 25 of unwitnessed, and 14 of mixed, witnessed and unwitnessed. Even in this mixed batch, however, the sets themselves fall clearly into one section or the other. In the analyses presented in the previous section the sets from the mixed batch were combined appropriately with those from the large witnessed batch and the large unwitnessed batch to show the effects of this major difference in conditions for all the data.

In the present section, however, the question is not so much the effect of witnessing as it is the effect of the position of the set on the page when the same general conditions are used throughout the page. For this reason, a more clear-cut comparison will be possible if the small mixed batch is not included. We have left, then, the 63 pages which contain only witnessed sets and the 25 pages of unwitnessed work which have all the sets recorded by L.H.G. herself. In the witnessed batch, the typical page contains only four sets, and the main comparison of results in different parts of the record page will be made in terms of the first four sets. Seven pages had up to six sets, and one had eight, but these do not make enough data in each set position to justify extending the study of the position of records on the page as such beyond the fourth set. In the case of the unwitnessed work, however, 12 of the pages had as many as six sets and no page ran beyond this number. Here the number of sets in the longer pages is sufficiently large to justify carrying the comparison through the sixth set position.

It would be important to find out how consistent the position effects are for the various sets on the page even if there were no difference in the general level of scoring for each set position. But if we know to begin with that there are differences in average level of scoring for the different sets, we have all the more reason for wanting to know how these are related to the internal distribution of hits within the sets. The four sets on the page of the witnessed section give, respectively, the following overall averages: 4.26, 4.06,

4.14, and 4.13. The six sets on the page for the unwitnessed section give the averages: 4.45, 4.44, 4.48, 4.36, 4.34, and 4.25. There is a general decline in both sections, but it does not follow the same pattern in each case. In fact, the sharpest drop in scoring is that between the first and second sets of the witnessed work, where the average difference of .20 hits per 24 dice, with 945 runs in the first set and 930 in the second, has a SD of .084 and a CR of 2.38 with P = <.01. The occurrence of this one instance of a significant decline in set score which is related to position on the page, coming as it does within the framework of the general trend toward a decline on the page in both sections, definitely increases the importance which attaches to the analyses of the different sets on the page for position effects. It will be of particular interest to see whether the profiles of scoring in the different columns are significantly different in the first and second sets of the witnessed section. The first one yielded an independently significant total score (deviation of hits = +244; SD = 56.10; CR = 4.35), while the second was well within the range of fluctuation usually attributed to chance variation (dev. = +59; SD = 55.65; CR = 1.06). How did this difference in scoring come about in terms of differences in position effects? And what can we learn from the entire analysis of different sets on the page regarding the relation of position effects to the general trend toward lower scoring in the later sets on the page?

These questions, and others which may arise in connection with the effect of position of the set on the page, are best answered by a study of Figures 3 and 4, which show the results for the witnessed and the unwitnessed sections, respectively.

The most interesting general feature about these graphs is the remarkable consistency with which the position effects found in the composite set for each section as a whole show up in these subdivisions of the data. The marked decline in scoring in the first column is present here in all ten sets shown in the two graphs. The absence of a striking degree of salience in the middle columns of the witnessed work is found here to characterize the entire page of witnessed records. On the other hand, the significant ending salience of the middle columns for the unwitnessed section, resulting in a general incline of scoring in these columns when L.H.G. did her

own recording, is found with remarkable consistency in all sets on the page. Finally, there is the unmistakable tendency for the last column of each set to show more ending salience than do the others. The only instance in both graphs in which the end position of column ten did not average higher than the last position of the combined middle columns is the second set on the page in the witnessed section, and this particular set, as we have seen, gave only insignificant results. In fact, in most instances the advantage of the end position of the tenth column, or the very last trial of the set, over *all other* end-of-the-column positions in the set is quite marked.

So much for the consistencies. Now what, if any, differences

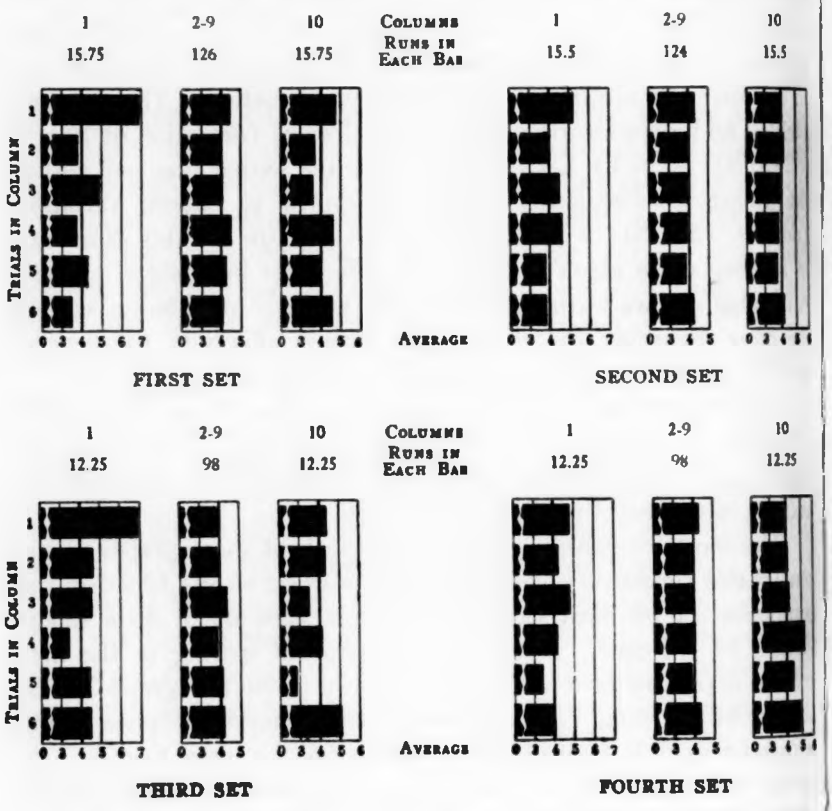


Fig. 3. Position effects in the witnessed data in relation to the location of the set on the page.

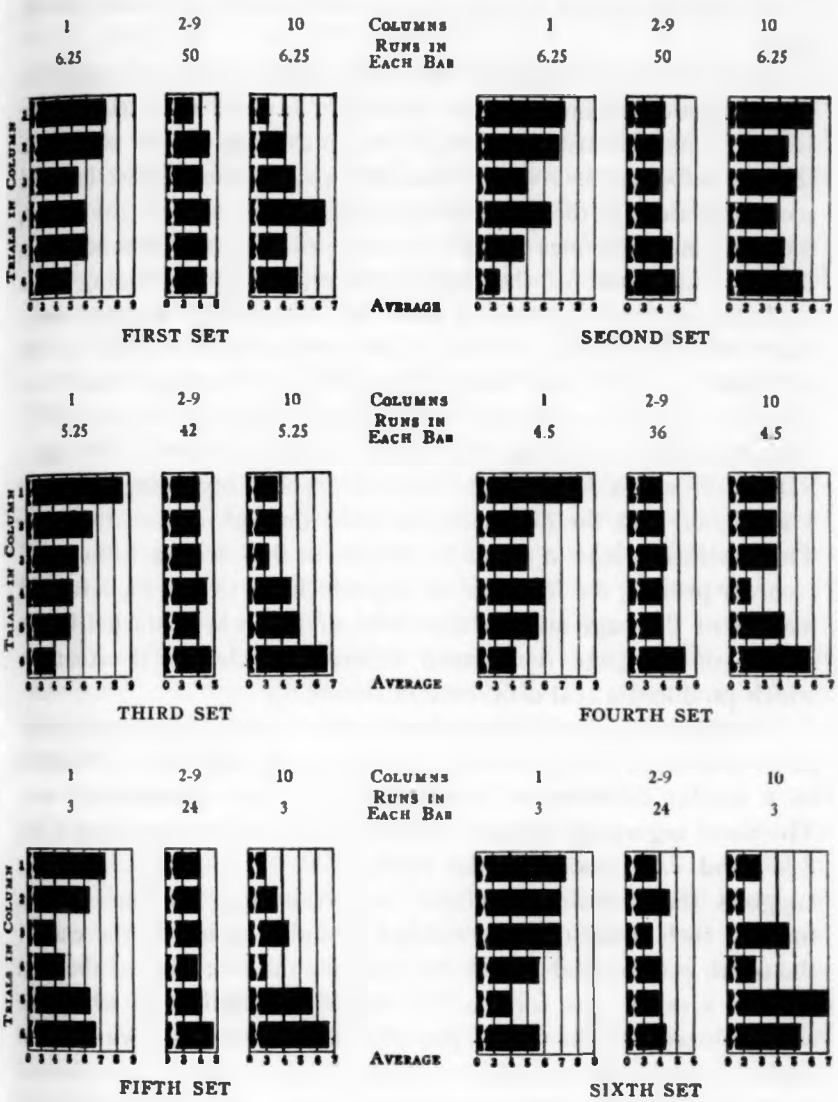


Fig. 4. Position effects in the unwitnessed data in relation to the location of the set on the page.

in position effects are associated with the location of the set on the page?

One observation which comes from this analysis in regard to the witnessed section concerns the highly favored first trial of the set. We find this trial position giving an average rate of scoring in the two left-hand sets which is about equal to the highest level of scoring attained in the unwitnessed work. These sets are, of course, the odd-numbered ones in the subject's order of performance. On the right-hand side of the page, however, the corresponding trials in the second and fourth sets result in scores which average much lower by comparison. In fact, if we combine the first trials of the left-hand sets (28 runs averaging 6.93) and compare them statistically with the same two trials from the right-hand sets (27.75 runs averaging 5.05), the difference in average is 1.88. This has a SD of .49 and a CR of 3.84 with the probability being less than 1 in 10,000 that the difference occurred through chance variation. This justifies at least a tentative conclusion that, with a witness and recorder present, the first trial of sets which started on the left-hand margin of the page and the first trial of sets which started in the middle of the page represented different psychological situations which produced a real difference in results.

The psychological factor of importance in this instance seems to be related to the presence of a witness, for we find no evidence of a similar difference in the first trials of the unwitnessed sets. The three beginning throws for the sets on the left averaged 7.20, 8.57, and 7.33; those on the right, 7.20, 8.22, and 7.33. This suggests that when the subject was recording her own scores, totaling each column as she finished it and stopping at the end of the set to get the total for all ten columns, the first trial of the next set was a salient one for the PK function regardless of where the set was located on the page. But when an experimenter was present to do all the recording and computing, the first trial of a set showed its characteristic degree of salience only when the starting-point was clearly identified by its position on the record page. It may be that the beginning salience of the set in the witnessed data was derived chiefly from the subject's perception of the structure of the record sheet. This would account for salience in the clearly marked left-

hand sets, while the absence of spatial separation between the sets at the center line of the page would explain the fact that the subject did not react in the same way in making a new start here. In the unwitnessed work, on the other hand, the subject herself had to perform the task of adding up her score on the last set before starting the next one. This interposed task may be what gave rise to the beginning salience of the set even in the middle of the page.

The second set on the page in Figure 3, which gave the lowest deviation as a whole for the witnessed section, shows a general flattening out of the profiles of the columns throughout the entire set. Thus we see that the drop in scoring from the first set to the second one seems to be reflected in a tendency for scoring in all positions to fall closer to the chance average.

Another result which is shown by Figures 3 and 4 is the tendency for sets coming nearer the end of the page to show more ending salience. That is, the last column of the later sets on the page show a greater incline in scoring. This apparent effect is pointed out here solely on the basis of a visual inspection of the graphs. It suggests that the end of a set is psychologically more pronounced for PK if it is at the same time the end of a page. Or, to put it differently, we may have three factors of ending salience which are combined in the last sets on the page: those of the column, of the set, and of the page.

It seems reasonable to suppose that the end of the page would more frequently have psychological significance for the subject when she was working alone than when there were two people involved in the test. Working alone, she would be free to determine for herself when a page would be ended. Thus the question arises: Is there in the unwitnessed section any accentuation of ending salience in the last sets on the page?

Of the 25 pages which were completely unwitnessed, four ended with the second set, three ended with the third set, six ended with the fourth set, and 12 ended with the sixth set. When the sets which were last on the page are picked out and combined, we have the right-hand half of Figure 5. The results might best be compared with the first sets in Figure 4, all of which were first on the same pages, and these have been reproduced as the left-hand half of Figure 5 to aid in making visual comparison.

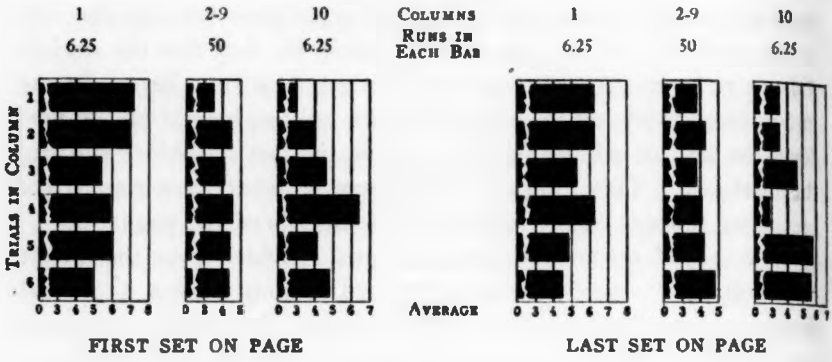


Fig. 5. First and last sets on the page in the 25 pages of unwitnessed data.

There is in this comparison a strong suggestion of a page salience effect. Two facts in Figure 5 indicate it: (1) ending salience of the set is more pronounced in those sets which are last on the page; and (2) beginning salience is greater in those sets which are first on the page. These observations are not conclusively established on the basis of the data covered in this report. The following statistical comparisons will show how strongly they are supported by the differences shown in the graph. The rate of scoring in the last two trials of the last-on-the-page exceeds the rate in the last two trials of the first-on-the-page sets to a degree which would be expected on a chance basis one time in twenty such comparisons ($P = .05$). The amount of ending salience in the two sets of the graph may be estimated roughly by comparing the first two and last two trials of column 10 in each set. For the last-on-the-page sets, this difference gives $P = .002$; for the first-on-the-page sets, $P = .1$. This is a striking difference in favor of page ending salience. On the other hand, the advantage in the first two trials of the set is slightly in favor of the first-on-the-page sets; the 12.5 runs of the first two trials combined average 7.12 as compared to the average of 6.24 for the first two trials in the last sets on the page. Here the difference, though slight, is in the opposite direction ($P = .12$) as we would expect if beginning salience of the page is present. This factor of page salience is one which should be investigated further as opportunities present themselves in future studies of position effects.

Position Effects Throughout the Experimental Series

Humphrey and Rhine (4) have pointed out that some of the aspects of patterning of PK successes shown by L.H.G. are in some way tied up with her own particular personality. Is the reaction to structure learned or is it there at the start? If it is present from the beginning, does it disappear as the subject repeats the tests through a long series, or does the salience of the record structure change significantly in any way with experience?

To try to answer these questions, I subdivided the 25 unwitnessed record pages, which showed position effects most clearly, into four chronological groups as nearly equal in size as they could be made without splitting an experimental session. The first of these

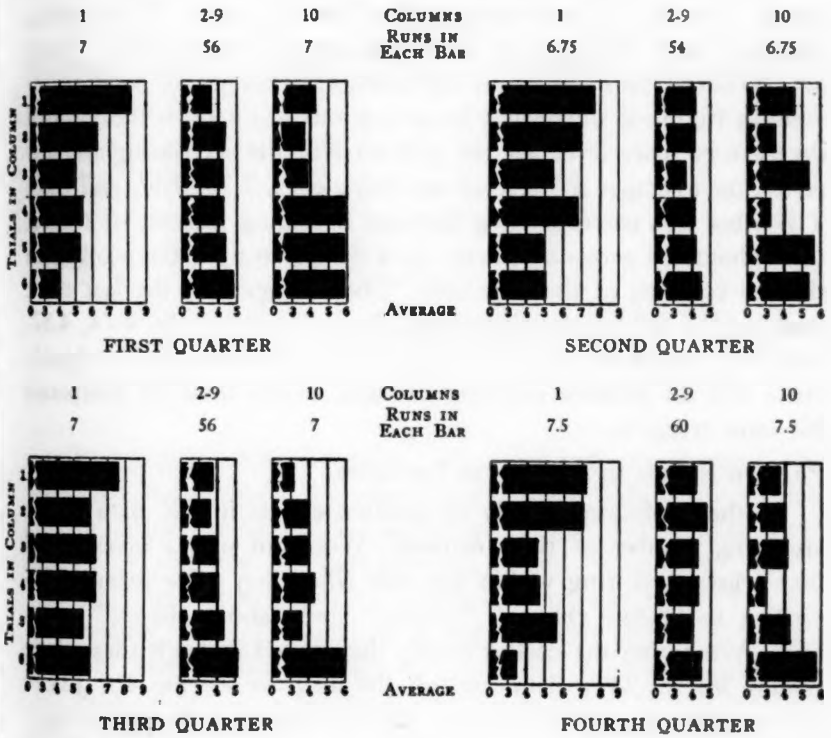


FIG. 6. Position effects in the 25 unwitnessed pages in relation to the chronological order of the experimental series.

pages was dated September 7, 1935, and the last, April 2, 1936. The witnessed work started on the same day and it was interspersed with that done under the unwitnessed condition throughout the experiment. Apparently, personal convenience was the factor which determined whether L.H.G. worked alone or with E.P.G. present. A report by Gibson and Rhine (3) deals with exploratory PK tests which were made during a visit of C. E. Stuart to Grand Rapids for the purpose of witnessing the conditions of the cup series, already under way. Stuart began his experimentation on September 8, 1935, and continued for about a week. The earliest data of the present report were the result of his visit, and they represent the first dice which L.H.G. threw for scientific testing purposes.

The four composite chonological sets of Figure 6 tell their own story. Position effects were present from the start of the series, and they held relatively steady throughout the experiment. There are, however, two suggestive chronological changes in position effects in Figure 6 which may be put on record. One is the gradual decrease in score level for the *first* trial of the set throughout the series, the averages in the four sets being 8.14, 7.70, 7.57, and 7.20. The other is a corresponding decrease in ending salience of the set throughout the series as shown by a comparison of the scoring in the last columns of the four sets. The averages for the last three trials of the set for the chronological quarters are 5.86, 4.74, 4.57, and 4.31. However, final decision regarding the statistical significance and the possible meaning of these trends must be postponed for later research.

Position Effects in Relation to Set Scores

In the exploratory study of position effects in PK data in the preceding number of this JOURNAL, Woodruff and I investigated the decline in scoring within the runs when they were grouped according to "below chance," "chance," and "above chance" scores (5). We found the decline evenly distributed through these three groups for J.L.W.'s data, but all the drop in scoring for J.G.P. occurred in the runs which gave scores below the chance average. It seemed important in the present study to find the relative distribution of hits throughout the set when L.H.G.'s data were grouped according to total set scores.

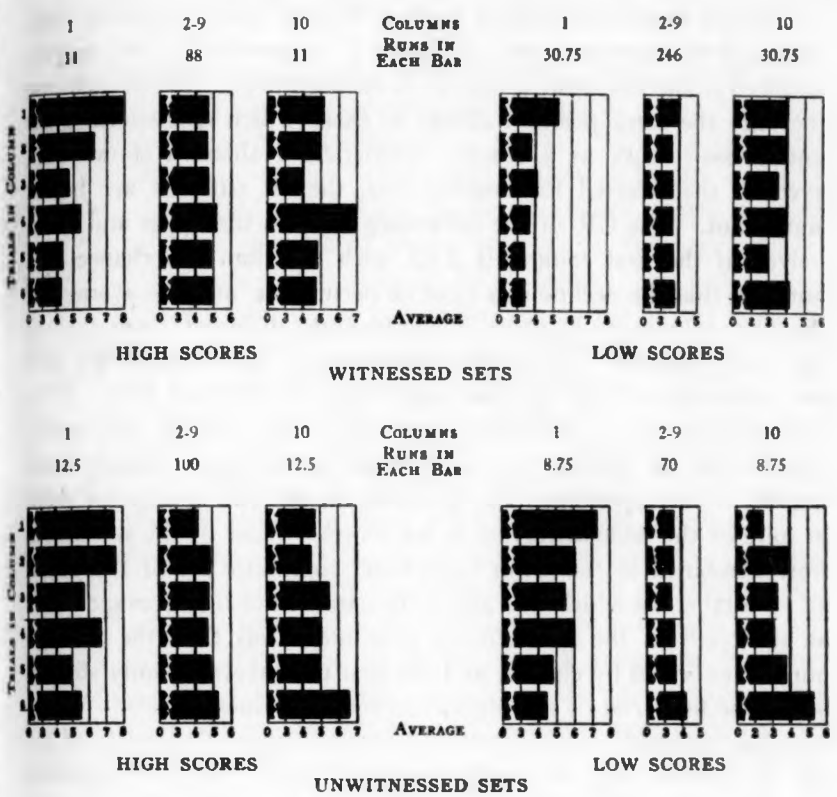


FIG. 7. Position effects in each section of the data, witnessed and unwitnessed, in relation to high and low set scores.

The results of each section, witnessed and unwitnessed, were divided into four groups in accordance with the following set scores: 71 and above; 66-70; 61-65; and 60 and below. Figure 7 shows the composite sets for the two extreme groups in each section. If changes in the general level of scoring are reflected by differences in the profiles of the columns, we would naturally expect this fact to be most clearly shown in the two groups which represent the opposite extremes of score variation. Since the results in Figure 7 were selected on the basis of differences in average, the significance of the graphs rests entirely upon internal differences within each set or upon the comparison of profiles from set to set.

Simple inspection suffices to show that in the unwitnessed data, shown in the lower two sets of Figure 7, the profiles are just as pronounced in the low-scoring sets as in the high ones. And in each case they are the same position effects as those which characterized the unwitnessed work as a whole. Statistical evaluation shows that, even in the selected low-scoring sets, the hit patterns are highly significant. The CR of the difference between the upper and lower halves of the first column is 2.42, with less than one chance in a hundred that the decline is a random occurrence, and the average of the first column as a whole is significantly different from that of any other column. The smallest difference is that between the first two columns, and this has the highly significant CR of 4.76. With position effects as a criterion of the occurrence of PK, the conclusion is that the psi function was present in an approximately equal degree in corresponding trial positions in the two groups of data, in spite of the wide difference in set scores. None of the sets which were combined in the lower right-hand composite set of the graph had a total score which was above the expected chance average. Yet all the trials in the first column give more hits than the average number expected by chance, and the first trial averages only slightly below the first trial of the highest scoring unwitnessed sets! Whatever the favorable scoring factors present in these first trials of the set, it appears that they were operating even when circumstances were running against a high score in the set as a whole.

In the witnessed work, on the other hand, the two sets for high- and low-scoring data show an interesting contrast in position effects. Looking at the upper left set, which is based upon witnessed data with set scores of 71 and above (where 60 is "chance"), we find that the position effects are remarkably like those which have been found to characterize the unwitnessed work. There is the usual high rate of scoring in the first trial of the set, but the average declines gradually throughout the first column instead of dropping off sharply after the first trial. In the center columns, there is a general incline in scoring through the column, another fact which has previously been associated only with the unwitnessed work. The last column also shows a higher general average for the last three trials (5.52) than for the first three (4.70), but it is irregular

in that the highest rate of scoring is in the fourth position instead of in the sixth one.

The composite set for the witnessed work which scored at or below the level of chance expectation, shown in the upper right section of Figure 7, is also familiar to us, for this set bears a remarkable resemblance to the one in the same position in Figure 3, which was the low-scoring, second set on the witnessed sheets. There were 62 witnessed sets in the second position on the page, and of these, only 33 gave a total score of 60 or below. So, with a total of 123 witnessed sets in the lowest scoring group as the basis of the composite set shown in Figure 7, the resemblance is all the more significant. It is unlikely that it can be explained in terms of the relatively small group of data which was common to the two composite sets under comparison. Rather, the conclusion indicated is that conditions affecting PK performance were not constant during all the witnessed tests. In those witnessed sets in which the conditions were most favorable, the subject's performance (judging from position effects, which are used here as the criterion of the operation of PK) approached the high level achieved when she was working alone. When the conditions were unfavorable, however, whether because of a non-salient position on the record page or for reasons which cannot be specified, the profiles were flattened out until about all that remained was the salience of the first trial of the set. And even that trial was comparatively less salient, as shown by the fact that the difference in average between the first trial and the other five trials of the first column was smaller for the low-scoring sets (diff. = 1.59) than for the high-scoring ones (diff. = 2.89).[4]

The contrast in position effects for the witnessed sets with high and low scores suggests that these results are not essentially different from the unwitnessed tests, but only that there were present at times, in the situation of working with an observer, inhibiting factors which are not found in the unwitnessed data. When, in the witnessed tests, the conditions were most favorable for PK, some of the score-depressing factors were removed and the resulting larger number of PK successes were distributed throughout the set as in

[4] This difference is in the same direction for the two intermediate groups not shown in Figure 7, to wit: for the 61-65 score group, it is .98; for the 66-70 group, 2.14.

the more uniformly favorable unwitnessed situation. When these inhibiting factors were strongest, genuine hits occurred least frequently and the position effects approached the vanishing point. The first trial of the set is where the PK effect showed up best in these data, and it is there, also, that PK is found to have the most staying power.

What factor or factors could result in the production of the characteristic hit patterns found in the low-scoring sets, particularly in those of the unwitnessed work? The discovery of significant position effects even in these sub-chance data suggests that these observations are not to be considered in terms of trends of scoring in individual sets; but rather that they may be statistical effects which emerge as a result of pooling sets. If the latter is true, the observed averages throughout this study would represent relative probabilities of making hits in the different trial positions when all the conditions affecting both random factors and the PK function are taken into account. But even if the relative probability is greater for the first trial of the set than it is for the sixth one, it does not necessarily follow that an unusually successful throw in the first position has any predictive value for success in any other position of the same set. This question of whether to attribute position effects chiefly to *scoring trends* or to *different probabilities* is one which requires further research.

Concluding Remarks

Within the limits of the analyses presented in the present report, L.H.G. has been found to show in her PK scoring in the Gibson Cup Series characteristic position effects which appear with remarkable consistency in the several ways in which the data have been subdivided. These position effects, which are more pronounced in the unwitnessed work, are characterized chiefly by high scoring in the first trials of the set, by a decline in scoring throughout the first column of six trials, by an incline in scoring in the middle columns of the unwitnessed results (with a suggestion of both beginning and ending salience of the middle columns in the witnessed sets), and by a marked incline in scoring in the last column of the set.

The witnessed sets which begin in the middle of the page show less pronounced position effects than do those which begin at the left-hand margin, and they also give lower total set scores. The unwitnessed sets do not show the same difference in position effects related to position of the sets on the page, but there is a strong suggestion of a page salience factor which is independent of the salience both of the column and of the set.

Position effects were found to be consistent chronologically throughout the unwitnessed work (which was co-extensive with the series as a whole).

Other things being equal, L.H.G.'s position effects were equally pronounced in her sets which scored at and below the chance level and in those which scored extremely high.

The extent to which these findings will contribute toward a more definite understanding of the psychology of the PK function cannot now be accurately estimated. The lawful regularity of these effects extending through the page, the series, and sets of high and low total scores reflects the presence in these data of a remarkably consistent and reliable psychological function, and the exceptions to the picture of perfect uniformity are themselves psychologically meaningful. These results, occurring as they did without the knowledge of either the subject or the experimenter and being so far outside the immediate purpose of the tests that they remained undiscovered for ten years, cannot be ascribed to biased dice, wishful thinking, recording errors, or any other reasonable counterhypothesis. PK is left as the only adequate cause of these effects. The discovery and detailed study of salience factors is necessarily the first step toward understanding them. The final step of explanation will require much time, many analyses, careful integration of findings, and extended experimentation. Perhaps the reader will have as much need for patience as the investigator has for persistence, and both will be required to suspend judgment many times while the evidence is accumulated.

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SOME PERSONALITY CHARACTERISTICS RELATED TO ESP PERFORMANCE

By Burke M. Smith and Betty M. Humphrey

ABSTRACT: Dr. Humphrey has already published two articles showing that high and low scorers in ESP drawings tests were separable on the basis of expansiveness or compressiveness in the form quality of their response drawings. In the present report Mr. Smith and she extend that finding into the field of ESP card testing, showing that drawings made in ESP tests can be used to separate high and low scorers in accompanying card tests. Students in the classroom were asked to make drawings in response to enclosed target pictures, and then they were given ESP card runs with a clairvoyance technique. It was found that the subjects who made expansive drawings did well on the card tests made at the same session, while those who made compressive drawings scored below chance expectation. The six individual subdivisions of the experiment all showed this same trend. Students were also given the Maslow Security-Insecurity Test, and it was found that high ESP scores were made by the secure subjects, while low ESP scores were obtained by the insecure subjects although the difference between the mean scores of the two groups was not significant.

The best separation was obtained when the expansion-compression ratings and the security-insecurity ratings were combined. The expansive, secure subjects made high scores on the ESP card tests, while the compressive, insecure subjects obtained low scores. The difference between the average scores of these two groups was independently significant. The expansion-compression criterion also proved useful as an instrument for indicating changes in the subjects' attitudes from one part of the experiment to the next.—Ed.

Introduction

In the June, 1946, issue of this Journal it was reported that subjects in ESP tests could be effectively separated into high- and low-scoring groups by means of an analysis of the form quality in their response drawings (2). The form quality which so divided the subjects was that of "expansion-compression" as originally described by Elkisch (1). In brief, this criterion distinguishes between "spacious," "free," "adventurous," "extraverted" drawings, on the one hand, and "meticulous," "fearful," "timid," "compulsive" drawings, on the other. In the clairvoyance series reported in the article referred to, the expansive subjects scored well on the target picture they were aiming at, while the compressive subjects obtained scores below mean chance expectation.

As a follow-up of that discovery it was decided to conduct an experiment to see if the form quality of drawings distinguishes between high- and low-scoring subjects in ESP card tests made during the same session. In this experiment tests were given to groups of students in the classroom. The students were asked to make a drawing in response to an enclosed stimulus picture, and then they were given two runs of card-calling tests under the BT procedure; that is, the procedure in which the experimenter holds each successive card apart from the deck without looking at it himself while the subjects make their calls. The ESP card scores of those subjects whose drawings were rated as expansive were compared with the card scores of subjects whose drawings were judged to be compressive.

The tests were made with introductory psychology classes during the period in which extrasensory perception was to be the topic for class discussion. In order to see if subjects' scores would be influenced by discussion of the experiments in ESP, the subjects were tested before a discussion of this topic and were tested again after the discussion. The experiment was planned in this way because of several series of tests, still unpublished, in which another experimenter had obtained score averages well below mean chance expectation with students who had attended discussions of the ESP research and its implications. In order to account for these negative deviations, the hypothesis was advanced that perhaps these students had taken the tests in a very serious, intellectual manner which led them to be inhibited and tense, and so to produce low scores.

The introductory psychology classes used in these experiments were those at Duke University in which B.M.S. was the instructor. He conducted the tests and guided the discussion on ESP. Dr. C. E. Stuart and B.M.H. both made judgments of expansion-compression on all of the drawings. The analyses and summaries of the data were done by B.M.H.

Experimental Plan

It was the original plan of the research to give the ESP tests, the discussion, and the retest in one class period. This plan was tried with Class 1, but it was found that too much time was con-

sumed in giving the ESP tests; and so, for this group the discussion was omitted.

With Classes 2 and 3, the ESP tests were given and the discussion begun during the class period on May 4, 1946. At the next class meetings on May 7, the discussion was continued for the first half of the period, and then the students were given ESP tests with exactly the same procedure as that used at the previous class period.

The pictures used in the clairvoyant drawing part of the test were cut from magazines such as the *Saturday Evening Post* and *Life*. They were mounted on 9" by 11" sheets of white cardboard and enclosed in opaque manila mailing envelopes. The top and face of the picture were indicated on the outside of the envelope so that the picture could be properly oriented for the subjects. The stimuli used were chosen and prepared by B.M.H. so that no one else, including B.M.S., would know their nature until after the test. Two such envelopes were prepared for each of the three classes used in these experiments. In addition, four decks of ESP cards were prepared for each group. Each deck was shuffled and enclosed in a separate box.

The type of record sheet used was that in which there are two columns with 25 spaces in each for recording the subjects' calls. (A picture of such a record sheet is given on page 190 of Volume 5 of this JOURNAL.) Each subject in these experiments was given two of these sheets stapled together with carbon paper between them. He wrote his calls upon these and then turned in the original record before the check-up.

The experimental procedure was carried out as follows: The envelope containing a stimulus picture was placed upon the chalk rail in front of the class, and B.M.S. asked the subjects to draw, upon the letter-size paper provided, anything that came to mind in regard to the enclosed picture. He assured them that the test was not one of drawing skill but that they were merely to put down any salient ideas that came to mind after they had oriented themselves toward the picture. After the drawings had been completed (usually in about five minutes) and the subjects' names, the class number, and the date had been written on the response sheets, the papers were collected.

Next the card-calling runs were done. A deck of cards was removed from its box behind an opaque screen, and the cards were shuffled and cut. The BT procedure was used throughout, with B.M.S. removing the cards one by one (without looking at them), and the subjects writing down their own calls on the sheets described above. The cards were always handled behind the screen and they were not looked at even by B.M.S. until after two runs had been completed. During the first run with Class 1, he handled the cards at the rate of one every ten seconds. This proved to be too time-consuming, and for all runs thereafter, he handled them at the rate of one every five seconds. In order to signal the subjects when each card was removed from the pack, the experimenter rapped twice with a coin or pocket knife on the desk.

At the end of one run done in this manner, there was a slight pause while the cards were carefully returned to their box and the second deck readied. Then the second run was done in the same way. At the end of this run, the original records of the subjects' calls were turned in to the experimenter, while the subjects retained the carbon copies for checking.

At this time the envelope holding the picture "aimed at" in the clairvoyant drawing was opened by the experimenter and placed in full view for the subjects to see how well they had done in making their response.

While the subjects were looking at the stimulus picture, B.M.S. recorded the card order for the two runs just finished. He recorded them on the same type of record sheet the subjects used, but kept the cards in their true order for later checking by B.M.H. No mistakes were found in this recheck.

When the correct order of the two decks had been recorded and the original data sheets placed in a brief case, B.M.S. read aloud the correct order and the students checked their scores on the duplicate sheets remaining in their possession.

As was mentioned before, in the case of Class 1, there was not enough time remaining at this point in the experiment to give the lecture on ESP and repeat the tests. Thus only a brief pause was allowed, and then the entire procedure outlined above was re-

peated. Of course, a different stimulus picture and different decks of cards were used.

After one drawing and two BT runs had been completed by Classes 2 and 3, the experimenter began the discussion of extrasensory perception. After a brief review of the experiments and of the broad general purpose of ESP research, the discussion took the form of questions from the students, which the experimenter answered. For these two groups of students (who met separately) this much of the experiment was done on May 4, 1946. At the next class meeting, which was on May 7, the discussion was continued for the first half of the period. Then the students were retested with the same procedure as was used before.

When the data were returned to the laboratory immediately after the class, B.M.H. judged expansion-compression in the drawings before the BT runs were checked for hits. This judgment was made first so that it would not be influenced by knowledge of the subjects' scores. After the judgments were completed, she then checked the hits in the BT runs for all subjects. These runs were subsequently rechecked by an assistant.

In order to secure a better measure of the form quality shown in the drawings, Dr. Stuart (C.E.S.) was asked to judge the material for expansion-compression also. The measure used throughout the study consists of the average of the independent judgments of C.E.S. and B.M.H.

In the previously reported studies using expansion-compression a score of 1 was given for each drawing rated as expansive, and a score of 0 for each drawing showing compression. When the extremes were not obvious or easily decided, a score of .5 was given to the drawing. In those studies, each subject made four drawings, and if the four considered together had a total score of 2 or more on the expansion-compression analysis, the subject was labelled as expansive. If, on the other hand, a subject's set of four drawings had a score of less than 2, he was called compressive. In keeping with this manner of dividing the subjects into two groups, a similar division was made here. In these experiments, of course, each subject made only one drawing in each test period. If that drawing was given a score of either 1 or .5 in terms of the average

score given by C.E.S. and B.M.H., the subject was called expansive. If, however, the average of their judgments for a given subject's drawing was less than .5, the subject was placed in the compressive group. In the analysis of the ESP runs that followed, the ESP scores on the BT runs done by compressive subjects were added together to form one group, while those of the expansive subjects made up the other group. The first drawings were judged independently of those made in the second part of the experiment. Thus, a subject could be rated as compressive on his first drawing and expansive on his second; his ESP scores for the first part would be included in the compressive group, while those for the other would be included with the expansive group.

In addition to the above analyses, the ESP scores were also studied in relation to the subjects' scores on the Maslow Security-Insecurity Test (4), the short form of which (the first 25 questions) had been given to these subjects in connection with a research project carried out by Dr. H. Ansbacher.[1]

Since each subject made only one drawing in each section of the experiment, the drawings were not scored for ESP by the preferential matching method because in that method more than two drawings by each subject are desirable. Thus in the present research the drawings made in response to the enclosed pictures were used only for the judgment of expansion-compression.

In the analysis of the data of this experiment, the test of significance used was "Student's" *t*-test in which the standard deviation is estimated from the observed variations in the data. This method of testing significance between means, etc., is desirable when there has been multiple calling of a single deck of cards, as was the case in this experiment. When more than one subject calls a deck, the variance is changed in an unknown direction; therefore, the safest procedure is to use the observed variance in calculating the standard deviation.

In obtaining the probabilities associated with the *t*'s presented

[1] The writers gratefully acknowledge the permission of Dr. Maslow to mimeograph and use his scale for this purpose. We also wish to express our appreciation to Dr. Ansbacher who kindly allowed us to use these questionnaires which had already been scored. The scoring was rechecked by assistants in the Parapsychology Laboratory.

below, we have used "Student's" *t*-distribution when the number of cases in the sample was less than thirty. If the number of cases was greater than thirty, the normal probability integral tables were consulted.

Since consistency of trend among experiments is sometimes masked when the data are pooled, we have also combined the separate experimental groups by a chi-square combination method. Our *t*'s were converted to CR's of equivalent probability and combined according to the method described in Appendix 12, *Extra-Sensory Perception After Sixty Years* (5).

In the presentation of the results the data are divided into two sections: Section A, comprising the first or pre-discussion tests for all classes; and Section B, consisting of the second tests which were, for Classes 2 and 3, the post-discussion tests. Since the results of the second tests for Class 1 were not different from the post-discussion tests of the other classes, they were included in Section B.

Results

General Results

Considering first the results of Section A, the pre-discussion tests, we find that the first run for the three classes was well below chance expectation with an average run score of 4.59, while the second run was above chance expectation with an average run score of 5.40. These results, together with those for each class, are shown in Table 1 where it may be seen that the classes are remarkably consistent in showing this trend.

The *t* of the difference between the average run scores of the first and second runs is 2.62, which has a tabulated probability of .0044. Since this *t* has been found in one of two sections and since the direction of the difference was not predicted in advance, it is necessary to correct this probability by multiplying it by four (twice for each of the two alternatives mentioned). The resulting probability is .0176, which has only suggestive value.

The total deviation for the section is not significant since the deviation of −38 on the first run is cancelled by the deviation of +37 on the second run.

Table 1

GENERAL SUMMARY OF ESP RESULTS

SECTION A

Class	Number of Subjects	Date	Run 1			Run 2		
			Runs	Dev.	Av. Score	Runs	Dev.	Av. Score
1.....	36	May 3	36	−21	4.42	36	+19	5.53
2.....	32	May 4	32	−17	4.47	32	+ 2	5.06
3.....	24	May 4	24	0	5.00	24	+16	5.67
Total.....	92		92	−38	4.59	92	+37	5.40

SECTION B

Class	Number of Subjects	Date	Run 1			Run 2		
			Runs	Dev.	Av. Score	Runs	Dev.	Av. Score
1.....	36	May 3	36	+ 2	5.06	36	− 4	4.89
2.....	33	May 7	33	− 2	4.94	33	− 1	4.97
3.....	25	May 7	25	− 2	4.92	25	− 1	4.96
Total.....	94		94	− 2	4.98	94	− 6	4.94

BOTH SECTIONS

Class	Number of Subjects	Date	Run 1			Run 2		
			Runs	Dev.	Av. Score	Runs	Dev.	Av. Score
Total.....	186	May 3, 7	186	−40	4.79	186	+31	5.17

Section B shows no such wide swing from the first run to the second. The average run scores are slightly below chance expectation for both runs.

In both sections pooled, there are 372 runs, with a deviation of −9, which is not statistically significant.

The main interest in the experiment attaches not to the total results, of course, but rather to their subdivisions according to the expansion-compression criterion and the Security-Insecurity Test.

Expansion-Compression

The results of the expansive and compressive subjects in each class are shown in Table 2 and in Figure 1 for Sections A and B separately. There it may be seen that *for every group in both sections the average run score of the expansive subjects is higher than that of the compressive subjects.*

Table 2

BT Run Scores as Divided by the Expansion-Compression Shown in One Clairvoyant Drawing from Each Subject

Section A

Class	Expansive Subjects			Compressive Subjects			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
1.....	34	+ 9	5.26	38	−11	4.71	.87
2.....	36	− 8	4.78	28	− 7	4.75	.06
3.....	12	+15	6.25	36	+ 1	5.03	1.91
Total.....	82	+16	5.20	102	−17	4.83	1.07

Section B

Class	Expansive Subjects			Compressive Subjects			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
1.....	32	+ 4	5.13	40	− 6	4.85	.57
2.....	38	+ 5	5.13	28	− 8	4.71	.71
3.....	26	+ 7	5.27	24	−10	4.58	1.15
Total.....	96	+16	5.17	92	−24	4.74	1.38

Both Sections

Class	Expansive Subjects			Compressive Subjects			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
Total.....	178	+32	5.18	194	−41	4.79	1.72

The t_d of the pooled totals is not significant ($t = 1.72$), but this measure does not take into consideration the consistency of the results of the three classes. A chi-square combination of the t's in both sections gives a chi-square of 6.50 (with six degrees of freedom). When the probability associated with this chi-square is corrected for the fact that we have obtained six cases out of six according to hypothesis (that expansives will obtain higher scores than compressives), we get a probability of .0058, which is statistically significant.

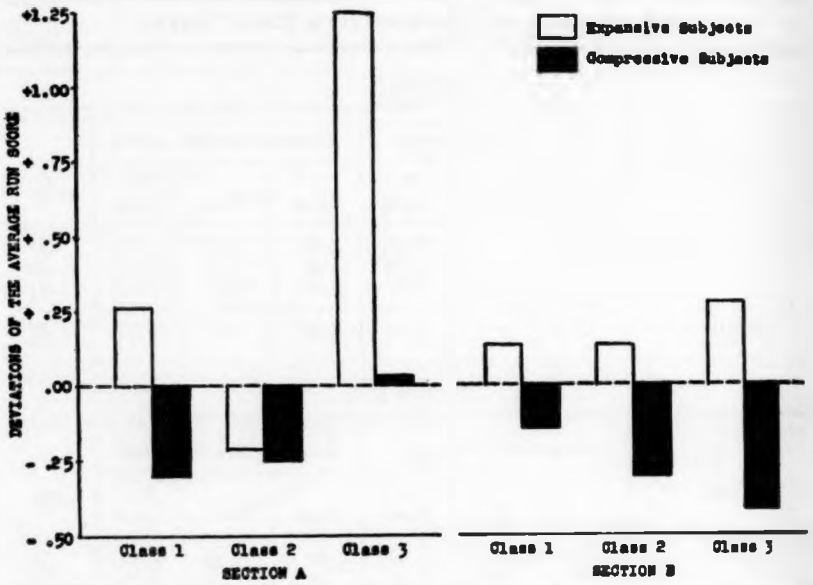


FIG. 1. Deviations of the average run scores for the expansive and compressive subjects in each class.

Thus we may say that the expansion-compression criterion has successfully discriminated between high- and low-scoring subjects in an ESP test outside the drawing task itself.

Inasmuch as the judgments classifying the drawings into expansive and compressive categories involve some subjectivity, it is important to determine the degree of agreement between the two judges in this experiment. The independent judgments on each drawing were correlated for each class in each section. Table 3

Table 3

CORRELATIONS BETWEEN EXPANSION-COMPRESSION JUDGMENTS OF TWO JUDGES (C.E.S. AND B.M.H.)

Class	Section A			Section B		
	r	N	P	*r*	N	P
1.....	+.75	36	< .0001	+.50	36	.0008
2.....	+.52	32	.001	+.62	33	.0003
3.....	+.51	24	.005	+.63	25	.0002

presents the correlation coefficients and the probabilities for each of these subdivisions. Inspection of this table reveals that there is a very significant degree of agreement between the two sets of judgments, the correlation coefficients ranging from +.50 to +.75. Such a high degree of correlation between judges on this type of material is very unusual in psychological studies.

Security-Insecurity

In order to separate the subjects into two groups on the basis of the Maslow Security-Insecurity Test, it was decided to use the median point[1] as the dividing line, subjects above the median being arbitrarily designated as "secure," and those below the median being called "insecure."

The division of the subjects according to this scale produces virtually the same degree of separation as did the division according to the expansion-compression criterion. The results of this separation are presented in Table 4 and in Figure 2 for each of the classes within each section. The secure subjects obtained an average run score above chance expectation (5.11), while the insecure subjects had an average run score below that expected by chance (4.71). The *t* of the difference between the averages of the two groups is 1.72, which is in the suggestive range, with a probability of .04.

When we examine the results for consistency of trend from class to class, we find that four of the six cases follow the trend shown by the total. Since we do not have an a priori hypothesis upon which

[1] The median used here is that computed by Dr. Ansbacher on the basis of Security-Insecurity questionnaires filled out by approximately 400 students.

Table 4

BT Run Scores as Divided by the Maslow Security-Insecurity Test (Short Form)

Section A

Class	Secure Subjects			Insecure Subjects			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
1	44	+ 8	5.18	22	−16	4.27	1.30
2	26	+ 2	5.08	36	−18	4.50	1.17
3	24	+ 2	5.08	24	+14	5.58	.81
Total	94	+12	5.13	82	−20	4.76	1.07

Section B

Class	Secure Subjects			Insecure Subjects			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
1	44	+ 5	5.11	22	−16	4.27	1.69
2	26	+ 9	5.35	38	−14	4.63	1.20
3	26	− 5	4.81	24	+ 2	5.08	.47
Total	96	+ 9	5.09	84	−28	4.67	1.36

Both Sections

Class	Secure Subjects			Insecure Subjects			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
Total	190	+21	5.11	166	−48	4.71	1.72

to predict the trends here, however, it is necessary to base a hypothesis upon the first case (Class 1, Section A), and then ask what is the probability that three of the five remaining cases will follow a similar trend. When the probability of getting the observed sum of chi-squares (8.23) is corrected for this probability of getting three out of five cases in the same direction, we get a probability of .11, which is not significant.

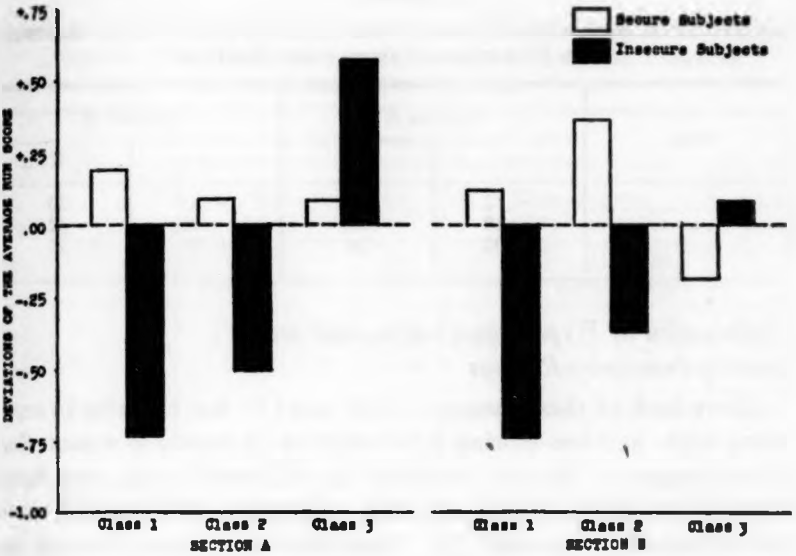


FIG. 2. Deviations of the average run scores for the secure and the insecure subjects in each class.

Classes 1 and 2 consistently show trends in keeping with the total, while the results for Class 3 in both sections are reversed.

Since the division of the data by the expansion-compression criterion produced results remarkably similar to those given by the division in terms of the Security-Insecurity Test (both *t*'s of the difference were 1.72), one might suppose that this similarity was due to a high degree of correlation between the two measures. An analysis to determine the degree of relationship between expansion-compression and security-insecurity revealed that the two are not correlated to any extent. The correlation coefficients are given in Table 5, where it may be seen that only Section B of Class 1 shows any degree of correlation between the two measures, and that a negative one. The latter is not significant since it has a probability of approximately .04. None of the other coefficients even approach this level. Thus there appears to be no correlation between the expansion-compression criterion and the Maslow Security-Insecurity Test.

Table 5

COEFFICIENTS OF CORRELATION BETWEEN SECURITY-INSECURITY RATINGS AND EXPANSION-COMPRESSION RATINGS

Class	SECTION A		SECTION B	
	r	N	*r*	N
1	−.12	33	−.33	33
2	−.10	31	−.08	32
3	−.02	24	+.03	25

Combination of Expansion-Compression and Security-Insecurity Ratings

Since both of these measures were more or less effective in separating high- and low-scoring ESP subjects, it stands to reason that a combination of the two measures would result in an even more striking separation of the subjects. Therefore the subjects were divided into four groups: (1) those who were expansive and secure; (2) those who were compressive and insecure; (3) those who were expansive and insecure; and (4) those who were compressive and secure.

As was expected on the basis of the previous results, the greatest difference was found between the scores of the first two groups—the expansive, secure subjects and the compressive, insecure subjects. The average run score for the former group was 5.31 for the pooled total of all classes, while the average run score of the latter group was 4.51. The *t* of the difference between the two groups is 2.48, which is significant with a probability of .006. The results for these two groups are given in Table 6 and in Figure 3.

When we consider the matter of consistency, we find that in all six subdivisions, the expansive, secure subjects have higher average run scores than do the compressive, insecure subjects. As a measure of this consistency we may apply the chi-square combination test here as he did with previous results. The chi-square is 8.29 with six degrees of freedom. When the probability of this chi-square is corrected for the fact that six cases out of six gave results according to hypothesis, we get a probability of .0034, which is statistically significant.

Table 6

COMPARISON OF THE AVERAGE RUN SCORES OF THE EXPANSIVE, SECURE SUBJECTS WITH THOSE OF THE COMPRESSIVE, INSECURE SUBJECTS FOR ALL THREE CLASSES

SECTION A

Class	EXPANSIVE, SECURE SUBJECTS			COMPRESSIVE, INSECURE SUBJECTS			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
1.....	24	+14	5.83	14	−13	4.07	1.80
2.....	16	− 2	4.88	16	−12	4.25	.79
3.....	6	+ 6	6.00	18	+ 5	5.28	1.08
Total.....	46	+18	5.39	48	−20	4.58	1.60

SECTION B

Class	EXPANSIVE, SECURE SUBJECTS			COMPRESSIVE, INSECURE SUBJECTS			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
1.....	16	+ 5	5.31	10	− 8	4.20	1.46
2.....	16	+ 6	5.38	18	−11	4.39	1.08
3.....	16	0	5.00	14	− 5	4.64	.42
Total.....	48	+11	5.23	42	−24	4.43	1.67

BOTH SECTIONS

Class	EXPANSIVE, SECURE SUBJECTS			COMPRESSIVE, INSECURE SUBJECTS			t_d
	Runs	Dev.	Av. Score	Runs	Dev.	Av. Score	
Total.....	94	+29	5.31	90	−44	4.51	2.48

The average run scores for the expansive, insecure subjects and those for the compressive, secure subjects were virtually chance: 4.95 and 4.92, respectively.

The two measures combined (expansion-compression and security-insecurity) have separated high- and low-scoring subjects in ESP card tests to a greater degree than either measure alone.

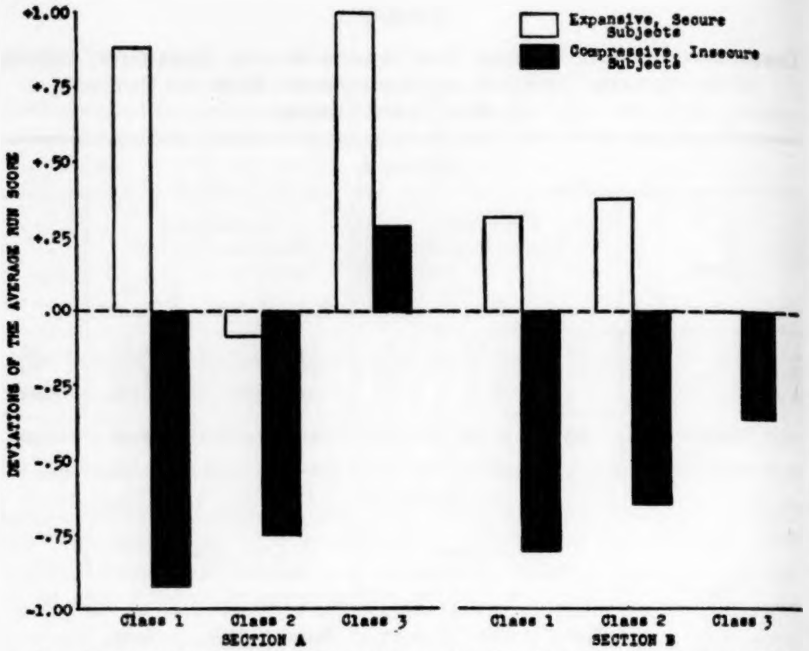


FIG. 3. Deviations of the average run scores for the expansive, secure subjects and for the compressive, insecure subjects in each class.

DISCUSSION

Counterhypotheses

Either in terms of the expansion-compression criterion alone, or in terms of the combination of the two personality measures, the results of this experiment have been divided into two groups with significantly different scoring levels. The results are thus not ascribable to chance.

Inasmuch as the experiments were planned for the purpose of getting a measure of extrasensory perception, all of the necessary precautions against alternative hypotheses were taken. Knowledge of the ESP results did not influence the judgment of the expansion-compression categories of the drawings because at the time of the judging, neither of the judges was aware of the ESP results. The first judge (B.M.H.) made her classifications of expansion-compression before the original ESP data sheets were checked for ESP

scores, and the second judge (C.E.S.) was not told the ESP scores prior to making his judgments. Any knowledge of the ESP scores that either of them might have had would have had to be of an extrasensory nature.

The classification of the subjects into expansive, compressive, secure, and insecure groups was done on the basis of relatively objective and demonstrable criteria. This statement is supported by the high degree of correlation between the judgments of C.E.S. and B.M.H. in classifying the drawings into expansive and compressive types. The Security-Insecurity Test had been previously standardized, and the test scores used in the present research had been obtained several weeks earlier as a part of a research project of another instructor.

On the basis of these considerations there seems no doubt but that the observed differences in scoring levels between the expansive, secure subjects and the compressive, insecure subjects are the result of a differential functioning of the ESP ability in the two personality syndromes. The present research represents, then, a confirmation of the earlier reported work (2) in which high- and low-scoring subjects could be separated on the basis of the form quality of their drawings.

General Comments

One of the most interesting findings of this experiment is the discovery that a subject's drawing can be used to predict his success on an ESP card test which is, strictly speaking, *outside* the drawing task. In the previous studies in which expansion-compression was used, the analyses were made on data in which the drawings themselves served the dual role of personality classification *and* ESP measure. Now we find that the form quality in the drawing tells us something more than how likely it is that the drawing itself will be good evidence of ESP. It tells us also something about the subject's chances of success on ESP card tests. The findings of this experiment indicate that the subject's mental attitude toward the ESP drawing test is in some respects the same as it is toward the ESP card test—that he leaves clues in his drawing which suggest how well he is going to do in the card test to follow. Whether *any*

drawing would serve this purpose or not will have to be decided by research. It is conceivable that a "free" or spontaneous drawing by the subject would enable one to predict his chances for success in ESP card tests too. On the other hand, it may well be that the drawing has to be conceived of as being an ESP-test drawing by the subject in order that it may carry indications of his attitude toward the ESP card test. The subject may have the same attitude toward ESP card tests as he does toward ESP drawings tests, and this fact alone may be the reason why the form quality of his "ESP" drawing enables us to predict whether or not he will succeed in the subsequent card tests. A "free" drawing may seem to the subject to be relatively divorced from the ESP test and if so, it would presumably not have any connection with his card scores.

When the results are divided either by the expansion-compression criterion alone or by the two personality measures combined, the consistency of the trends shown by the subdivisions of each class in each section are remarkable. For example, looking at Figure 1, we see that in *all* cases the expansive subjects made higher average ESP scores than did the compressive subjects. The same results are true with respect to the expansive, secure and the compressive, insecure subjects whose averages are graphed in Figure 3.

In the experiments reported in this paper, the ESP tests were of the clairvoyant type and the results are in harmony with those of the previously reported clairvoyance tests. The results that have been obtained in GESP tests indicate that the scoring trend of expansive and compressive subjects is reversed and the compressive subjects score higher. The limited available experimental evidence does not show this reversal by the secure and insecure subjects in GESP tests.

In the previous study in which the expansion-compression criterion was applied (3) it was suggested that the criterion appears to be primarily a measure of the subject's temporary state. This suggestion was based on the discovery that some subjects did change markedly in their degree of expansion or compression from one part of the experiment to the next and that their ESP scores changed correspondingly. That finding is further confirmed by the data of the present classroom experiment. We find, for instance, that of

the 41 subjects who made expansive drawings in Section A, 12 made compressive drawings in Section B. On the other hand, of the 51 subjects who made compressive drawings in Section A, 19 became expansive in the second section. Thus, we see that approximately one-third of the subjects received different ratings on their two drawings.

However, not only did their drawings change, but their ESP scores changed too. Considering only the subjects who changed from expansive to compressive, or vice versa, we find corresponding decreases or increases, respectively, in their ESP scores. The score obtained by each group is written directly below it in terms of runs and deviation:

Compressive Subjects Who Became Expansive:	
38:−12	38: +9
Expansive Subjects Who Became Compressive:	
24: +6	24:−11

When the results of these subjects are considered together, we see that for 62 runs as expansives they had a deviation of +15, and for 62 runs as compressives they had a deviation of −23. The critical ratio of this difference is 1.73, which is not significant; but the fact that the trend shown by the ESP scores is in the direction indicated by the hypothesis under consideration is strongly suggestive, and can be taken as supporting evidence for the contention that the factor or factors involved are subject to modification within a short period of time and by apparently minor changes in circumstances.

The inclusion in the experimental plan of a discussion of ESP and related problems between the first and second sections of the testing program had been aimed at determining the effect of such a discussion on ESP scoring, but it was also expected that any change in personality or attitude that would affect the ESP scoring would also be reflected in the form quality of the drawings.

That some subjects did change between the first and second sections is indicated by the evidence given above. However, those results do not tell us whether or not the discussion per se was the cause of the change. Although we do not have conclusive evidence

in these data, we get some suggestions as to the effect of the discussion by comparing the results of Class 1 with those of Classes 2 and 3.

In Class 1, in which there was no discussion between sections, approximately one-third of the expansive subjects became compressive and a fourth of the compressive subjects became expansive; thus there was a general trend toward compressiveness, 53 per cent of the subjects being compressive in Section A and 57 per cent in Section B.

With Classes 2 and 3, where there was a discussion of the ESP research between sections, a fourth of the expansive subjects became compressive, and almost half of the compressive subjects became expansive. These figures indicate a general trend toward expansiveness, because, whereas only 43 per cent of the subjects had been expansive in Section A, 57 per cent were expansive in Section B. Not only did fewer expansives become compressive, but many more compressives became expansive in Classes 2 and 3 than did so in Class 1.

Whether or not this trend toward expansiveness in Classes 2 and 3 was due to the discussion will have to be decided by future researches in which other conditions for the classes are kept constant. For example, interpretation of the results of the classes with and without discussion is hampered here by the time differences between the two sections for each class. It is conceivable that the trend toward expansiveness in Classes 2 and 3 was not due to the discussion, but rather to the interval of time between Sections A and B. If another experiment were to be done with the study of the effects of such a discussion as its primary aim, it would be desirable to have both sections of the tests come within the same session regardless of whether or not the class were to have the discussion interposed.

In view of the evidence that subjects do vary, for whatever reason, to the extent that their projected personality qualities, as indicated by their drawings, change appreciably within a brief period of time, it is suggested that the qualities of expansiveness and compressiveness are relatively temporary states of the individual and are not necessarily basic personality traits. The evidence already cited supports this point of view, but additional experimental data

are needed and should be had from simple but carefully controlled attempts at modifying the personality in the direction of expansiveness or compressiveness. The differences that have been previously reported in papers dealing with favorable and unfavorable experimental conditions and experimenter-subject relationships may be more completely interpreted when considered from this point of view.

On the other hand, security and insecurity, as ordinarily conceived and as measured by current tests, appear to be relatively enduring factors of personality, and may even be considered to be traits. It must remain for future research and analyses to clarify the relations of these personality factors to ESP scoring. However, the fact that the secure subjects tend to score better than the insecure subjects suggests that the ESP function, if not a sign of "normality" itself, at least operates best in well-adjusted individuals when a random selection of the population is tested.

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TELEPATHY AND CLAIRVOYANCE IN CLASSICAL ANTIQUITY

By E. R. Dodds[1]

I

The group of studies which the English call "psychical research" and the Germans "Parapsychologie" has in this country an historical affiliation to classical learning. Among the pioneers who in 1882 founded the Society for Psychical Research the leading spirit was a classical scholar, Frederic Myers; and important contributions were made to the new studies by Andrew Lang, M. A. Bayfield, Mrs. A. W. Verrall, and Professor Gilbert Murray.[2] In these circumstances a question naturally presented itself: did the contemporary phenomena which were now for the first time subjected to serious examination reflect any fresh light upon the field of ancient religious beliefs and practices? The question was raised by Myers in his essay on Greek Oracles,[3] and by Lang in a paper on "Ancient Spiritualism";[4] both writers answered it with a confident—perhaps too confident—affirmative. But since their day there has been little serious attempt to approach the problems of ancient religion from this particular angle. Jejune and obviously second-hand ancient material, torn from its context of thought and interpreted in the light of the author's prepossessions, continues to figure in the various popular and semi-popular "histories of occultism" and the like. On the other hand serious students of ancient beliefs

[1] Professor Dodds is Regius Professor of Greek at Oxford University. The essay presented here is reprinted by permission of the author and the Oxford University Press from *Greek Poetry and Life*, a collection of essays presented to Professor Gilbert Murray on his seventieth birthday by his Oxford scholars.

[2] Professor Murray was President of the Society in 1915-16; and he acted as percipient in two very remarkable series of telepathic experiments which are reported in its *Proceedings* (vols. xxix and xxxiv).

[3] In Abbott's *Hellenica* (1880).

[4] In *Cock Lane and Common Sense* (1894).

about the supernormal rarely[5] betray any knowledge of, or interest in, their modern counterparts.

Yet the Myers-Lang method may perhaps have a modest utility. Certainly no one who is familiar with ancient standards of evidence in such matters will expect to find in classical literature confirmation of the authenticity of any type of occurrence which he does not accept as already established by modern investigation. The scientific study of the preconceptions, illusions, false memories, and other factors which tend to vitiate testimony, and the insistence upon such documentation as shall minimize their influence, hardly began before the latter half of the nineteenth century. In antiquity the importance of first-hand documents in any branch of history was notoriously little appreciated; and first-hand ancient accounts of supernormal experiences are of extreme rarity. There is, however, another side to the matter. It may be argued that if a particular supernormal phenomenon, alleged to occur spontaneously among civilized people in recent times, is not attested at other times and places of which we have adequate knowledge, the presumption is thereby increased that it does not occur as alleged, unless it can be shown that its emergence is conditioned by an actual evolutionary change or by a shift in the focus of curiosity, such as might be produced by a new philosophical or religious outlook: thus if no case of telepathy had ever been recorded before, say, 1850, considerable doubt would be thrown on the actuality of its occurrence after that date, unless clear reason could be shown for its remaining so long unnoticed. This consideration has prompted me to attempt a summary examination of ancient beliefs about extrasensory perception.[6]

In attempting to apply to antiquity the critical canon suggested above, it is clear that two cautions must be observed. In the first place, although the surviving ancient literature on divination is in the sum total fairly considerable, we know that it is only a fraction of what once existed. The Stoic school, in particular, accumulated

[5] There are exceptions. Delatte, *La Catoptromancie grecque et ses dérivés*, makes a legitimate and convincing use of modern experiments in "scrying" to elucidate certain features of the ancient mantic practice. An example of the misapplication of modern analogies may be seen in de Jong's interesting but wrong-headed book on the ancient mystery-religions.

[6] I use this term to cover telepathy and clairvoyance, but not precognition.

extensive case-books: Chrysippus wrote two books on divination, another on oracles—in which, says Cicero, he collected innumerable responses, "all with reliable authority and testimony"—and another on dreams, reporting "many detailed dreams"; Diogenes of Seleucia, Antipater, and Poseidonius all wrote on similar topics.[7] In these circumstances the argument from silence is more than usually perilous. And secondly, it is a commonplace of psychical research that supernormal or quasi-supernormal experiences, more than any other class of human happenings, have the chameleon quality: from the background of belief against which they emerge they take so deep a color, not only in tradition but in the experient consciousness itself, that their identity is hard to isolate. Consider, for example, the difficulty of making anything intelligible out of the seventeenth-century witch-trials, relatively recent and relatively well-documented as these are: seen through the medium of a universally accepted belief-pattern, the underlying psychological and objective data are consistently distorted, often beyond recognition. The ancient belief-patterns, though less blindingly uniform, carry similar possibilities of distortion; and their influence is the harder to allow for in proportion as they are less familiar to the modern imagination.

There is no ancient word for telepathy, for clairvoyance, or for extrasensory perception. So far as they were recognized at all, they were embraced in the comprehensive notion of "divination" ("mantikē") along with retrocognition and precognition;[8] in practice the stress fell overwhelmingly on the last, since divination was popularly valued for its utility, not for its theoretical interest, and his own future usually concerned the inquirer more nearly than other people's present or past.[9] The ancients subdivided divination, not according to the content supernormally apprehended, but according to the method of apprehension. They distinguished "technical"

[7] Cicero, *de Div.* i. 3. 6; 18. 37; 20. 39. Other references in Zeller, *Philosophie der Griechen*,[5] III. i. 345 sqq.

[8] The typical diviner is Homer's Kalchas, "who knew things past, present and to come." But "divination" is often used in a narrower sense, with exclusive reference to the future.

[9] The questions asked of Delphi in Plutarchs day, "Should I marry?", "Should I make the voyage?", "Should I invest the money?", are probably typical of the average inquirer at all periods, though Plutarch prefers not to think so (*Pyth. orac.* 28). Cf. *def. orac.* 7, Porph, *ad Aneb.* 48, *de Abst.* ii. 52, and the leaden tablets found at Dodona (Bouché-Leclercq, *Histoire de la Divination dans l'antiquité*, ii. 319).

or inductive from "natural" or intuitive divination.[10] Cicero quotes as examples of the former class divining from entrails, the interpretation of prodigies and of lightning, augury, astrology, and divination by lots; to the latter he assigns divination in dreams and in ecstatic states. Apart from certain borderline types, which may have brought visual hallucination or muscular automatism into play,[11] the inductive species of divination are of little concern to the psychical researcher. But he will examine with interest the doctrine of intuitive divination, since some of the best modern evidence for extrasensory perception has been obtained with percipients in abnormal states (hypnosis and "mediumistic" trance), and well-authenticated cases of coincidental dreams are abundant in modern records. What he will chiefly find, however, will be not a theory but a religious belief-pattern—or rather, one belief-pattern superimposed on the remains of another. Trance divination is a vestigial shamanism; and Halliday[12] is doubtless right in regarding the Greek diviner as a shrunken medicine-man, whose gift must at one time have been considered innate, as an element or aspect of his *mana*. But already by Homer's day inductive divination has passed under the control of religion. The diviner, in Halliday's phrase, "holds his gift from God": Kalchas practises an art "granted him by Apollo," and all the great diviners of legend have a comparable status. Later,[13] we find the two branches of intuitive divination similarly organized in the interests of the Olympians: in the main, Apollo takes over the patronage of trance mediumship and his son Asclepius that of the veridical dream, although older powers like Hecate and the Corybantes are still held responsible in popular belief for the more alarming and disorderly sort of manifestations. The supernormal, canalised and controlled, becomes the sensible evidence of the supernatural, and its authenticity is in turn guaran-

[10] Cicero, *de Div.* i. 6. 12. The distinction is as old as Plato (*Phaedrus* 244 B sqq.).

[11] Visual hallucination may have played a part in catoptromancy, lecanomancy, hydromancy (cf. Delatte, op. cit.); muscular automatism in the famous alphabetic divination described by Ammianus (xxix. 1 and others (cf. Lang, op. cit., p. 316; Halliday, *Greek Divination*, pp. 218-22).

[12] *Greek Divination*, chap. 5.

[13] The reason why intuitive divination figures so little in Homer is presumably that it was still associated with magic and had not yet been incorporated in the Olympian system.

teed by its divine patrons: the Stoics spoke for the mass of men when they proclaimed the mutual interdependence of belief in the gods and belief in divination.[14]

So close an association with religious orthodoxy was naturally unfavorable to the growth of anything like critical study: it explains in particular the paucity of attempts at experimental investigation—what was of God was felt to be better left alone. Nevertheless, it is hardly correct to say, as Edwyn Bevan does,[15] that "the theory of telepathy and thought transference had not occurred to antiquity." At least one ancient account of divination—that of Democritus, about 400 B.C.—is founded on the notion of a physically mediated telepathy; and there are approaches to the idea in later writers.

Democritus' treatise *On Images*[16] is lost, but an outline of the doctrine which concerns us is preserved by Plutarch.[17] We learn that Democritus, like his successor Epicurus, explained dreams in general by the penetration through the pores of the dreamer's body of the "images" which are continually emitted by objects of all sorts and especially by living persons; he also held (and in this, says Plutarch, Epicurus did not follow him) that the images carry representations of the mental activities, the thoughts, characters, and emotions of the persons who originated them, "and thus charged, they have the effect of living agents: by their impact they communicate and transmit to the recipients the opinions, thoughts, and impulses of their senders, when they reach their goal with the images intact and undistorted." The degree of distortion which the images suffer in transit depends partly on the weather, partly on the frequency of emission and on their initial velocity: "those which leap out from persons in an excited and inflamed condition yield, owing to their high frequency and rapid transit, especially vivid and significant representations." This is definitely a theory of telepathy (and clairvoyance, if we extend it to inanimate "senders"), distinct from the complementary doctrine of *divine* images

[14] Cicero, *de Div.* i. 6. 10.
[15] *Sibyls and Seers*, p. 163.
[16] Diels, *Vors.* 55 B 10.
[17] *Q. Conv.* VIII. X. 2, 734 F (= Diels, *Vors.* 55 A 77). This passage has recently been discussed by Delatte, *Les Conceptions de l'Enthousiasme chez les philosophes présocratiques*, pp. 46 sqq.

which served to explain precognition.[18] The remark that people in a state of excitement make, to use the modern term, the best telepathic "agents" is deserving of notice, since it is confirmed by modern observations: a strikingly large proportion of telepathic dreams and hallucinations are reported as having occurred when the assumed agent was experiencing some physical or mental crisis.[19] —The theory as presented in this passage is concerned only with dreams, but it is probable that its scope was actually wider. Plutarch tells us elsewhere[20] that Democritus explained "the evil eye" on the same principle: the action at a distance is mediated by these same images, charged with a hostile mental content, which "remain persistently attached to the persons victimized, and thus disturb and injure both body and mind." These effects are apparently produced continuously, and not merely in sleep. It should be added that, if we are to believe Antisthenes,[21] Democritus undertook an experimental study of (divine or ghostly) images, sometimes isolating himself for the purpose in desert places and cemeteries: was his choice of desert places dictated by a realization of the difficulty which still confronts the student of "spirit" phenomena—the difficulty of *excluding* telepathy from the living?

An important further step towards the naturalization of the supernatural was taken by Aristotle, who rejected altogether inductive divination[22] and attributed the intuitive variety to an innate capacity of the soul.[23] In the treatment of veridical dreams[24] he is more cautious than Democritus. He begins by saying that it is difficult either to ignore the popular belief in mantic dreams or to accept it in the absence of any plausible explanation; for the traditional view that they are sent by the gods must be rejected—if the gods wished to communicate knowledge to men, they would do so in the daytime, and they would choose the recipients more carefully.[25] He accepts as intelligibly precognitive *(a)* dreams convey-

[18] Fragm. 166.
[19] Cf. *Phantasms of the Living*, i. 229.
[20] *Q. Conv.* v. vii. 6.
[21] *Diog. Laert.* ix. 38.
[22] Plut. *Plac. phil.* v. I; cf. Cicero, *de Div.* i. 3. 5, 33. 72.
[23] *On Philosophy*, fragm. 10 Rose. The passage is strongly Platonic in tone, and less explicitly skeptical than the later *de Div. p. somn.*
[24] *de Div. p. somn.*
[25] For the argument from the low intelligence of "mediums" cf. Cicero, *de Div.* ii. 63. 129 *fin.*; for the other, ibid. ii. 61. 126.

ing foreknowledge of the dreamer's state of health, which are reasonably explained by the penetration to consciousness of symptoms ignored in waking hours (cf. the Hippocratic *de victu* iv. 86); *(b)* dreams which bring about their own fulfilment by suggesting a course of action to the dreamer. There remain veridical dreams about matters too remote in space or time, or too complex,[26] to admit of explanation on these lines; and, in general, those whose fulfilment is independent of the dreamer. He rejects Democritus' view of such dreams, and inclines to fall back on coincidence ("if you shoot often enough, you will hit something sometimes"): failing this, he would prefer a non-atomist wave theory, based on the analogy of disturbances propagated in water or air.[27] Throughout the discussion he speaks as if he had in mind chiefly or exclusively precognition: even those events which are remote in space are not necessarily coincidental in time with the dream to which they correspond. But his wave hypothesis suits telepathy or clairvoyance much better than it does precognition: it is in fact a half-hearted adaptation of Democritus' telepathic theory with the atomist presuppositions left out.

The connection between divination and religion, which Aristotle had endeavored to dispense with, was reaffirmed by the Stoics. Poseidonius (about 135-50 B.C.) held that veridical dreams were due, if not to direct intercourse with the gods, then to the community of human with divine reason, or to reading the thoughts of the "daemons" who throng the air beneath the moon.[28] For the existence of a common reason in God and man the Stoics could claim the authority of Heraclitus (about 500 B.C.), and Chalcidius[29] seems to say that Heraclitus explained in this way "visions of unknown places and apparitions of the living and the dead"; but it is hard to tell how much of this passage is genuine Heraclitus and how much is Stoic amplification. Among such bold speculations

[26] 464 a I, 463 b I.

[27] 464 a 6.

[28] Poseidonius *apud* Cicero, *de Div.* i. 30. 64. In the first book of the *de Divinatione* this theory shares the field with the Platonic-Aristotelian conception of divination as an innate faculty of the soul, obscured by its association with the body.

[29] Diels, *Vors.* 12 A 20. Taken seriously by Delatte; but cf. Hamilton in *Classical Review* xlix (1935), p. 17. The theory of divination attributed to Heraclitus appears to be in fact that of Poseidonius (Reinhardt, *Kosmos u. Sympathie*, p. 401).

the humbler psycho-physical problem of extrasensory perception, which Democritus had stated and attempted to solve, naturally enough fell into the background. But there are some indications that Poseidonius' theory of divination (which has come down to us only in a confused and fragmentary form) included, along with much else, the notion of a physically mediated telepathy, if not between the living, at least between the living and the "souls in the air." Plutarch,[30] discussing the "daemonion" of Socrates, propounds the view that spiritual beings in the act of thinking set up vibrations in the air which enable other spiritual beings, and also certain abnormally sensitive men, to apprehend their thoughts. Such vibrations impinge upon us continually, but they can reach consciousness only when the mind is sufficiently calm to detect them, that is, as a rule only in sleep. Reinhardt[31] is probably right in thinking that Plutarch is here making use of Poseidonian ideas. A similar contrast between normal human perception on the one hand and daemonic and mediumistic intuition on the other was found by Cicero in Poseidonius: "as the minds of gods have community of feeling without eyes, ears or tongue . . . so human minds when set free by sleep, or in detached states of excited derangement, perceive things which minds involved with the body cannot see."[32]

Like the modern vibration theories of telepathy, the speculations we have been considering postulate a physical carrier for the mental content communicated. The plausible analogy of wireless telephony was not yet available; but experience offered other seeming analogues. In popular belief every kind of action at a distance was explained by occult emanations proceeding from persons or objects. The most striking and indisputable case of such action was the influence of the magnet upon iron,[33] which had impressed the imagination of Democritus[34] and had been used by Plato to illustrate the communication of poetic inspiration:[35] Quintus Cicero argues that it is no less mysterious and no less certain than divination.[36] And

[30] *Gen. Socr.* 20, 589 B.
[31] *Poseidonios*, pp. 464 sqq.; *Kosmos u. Sympathie*, p. 288 sq.
[32] *de Div.* i. 57. 129.
[33] Pliny, *N. H.* xxxvi. 126.
[34] Cf. Delatte, *Conceptions de l'Enthousiasme*, pp. 59 sqq.
[35] *Ion* 533 D sqq.
[36] Cicero, *de Div.* i. 39. 86.

there were other generally accepted examples: do not the phases of the moon work tidal changes in our blood and affect the growth of all living things?[37] and does not "the evil eye" imply a secret emanation from the human eye?[38] Such reflections were generalized in the Stoic and Neoplatonic doctrine of occult "sympathies," which when combined with the notion of a world-soul issued in something like a reinstatement, on a higher philosophical level, of the primitive conception of the world as a magical unity.

For the Neoplatonist the linkage has become nonphysical.[39] The world, says Plotinus,[40] is like one great animal, and its "sympathy" abolishes distance; distant members may affect each other while the intervening portions of the organism are unaffected, "for like parts may be discontinuous yet have sympathy in virtue of their likeness, so that the action of an element spatially isolated cannot fail to reach its remote counterpart." This principle provides a rationale both of prayer and of telergic magic, as Plotinus did not fail to point out (*Enn.* IV. iv. 40-I; IV. ix. 3). It provides also a rationale of what we call telepathy; but to this, so far as I can see, Plotinus nowhere makes an explicit allusion, though certain passages have been interpreted in this sense: he gets no nearer than the remark that *discarnate* souls may be supposed to communicate mutually without speech.[41] Nor did his successors, for all their interest in occult phenomena and in the relationship between mind and body, bestow much attention on extrasensory perception. Outside of metaphysics, Neoplatonism created no new patterns of belief: its concern was to defend old ones by giving them a metaphysical justification.

II

As the ancients had no name for extrasensory perception, so they practised no systematic observation of cases. The scattered examples which have come down to us are for the most part casually recorded and exceedingly ill evidenced. I propose briefly to review some of them, taking first those associated with oracles.

The most familiar of these is the famous story of the test

[37] Pliny, *N. H.* ii. 102.
[38] Plut. *Q. Conv.* V. vii. 2.
[39] On the difference between Poseidonian and Neoplatonic "sympathy" see Reinhardt, *Kosmos u. Sympathie*, pp. 248 sq., 252 sqq.
[40] *Enn.* IV. iv. 32.
[41] IV. iii. 18.

applied by Croesus to Delphi and six other oracles—the earliest example of what would to-day be called an experiment in long-distance telepathy. If Herodotus[42] is to be believed, Croesus had a shrewd appreciation of the conditions to be observed in such experiments: he took adequate precautions to exclude both normal leakage and the operation of chance. His test (as described) contrasts favorably with that attributed by Macrobius[43] to the Emperor Trajan, who sealed up a blank set of tablets and sent it to the oracle of Jupiter Heliopolitanus at Baalbek—an oracle which specialized in reading sealed letters without opening them. Trajan's missive was returned to him with the seal intact, accompanied by a second letter containing the god's answer. When the latter was opened, it in turn proved to contain a blank sheet of papyrus. The skeptic need not hesitate to believe this story; for the useful art of reading sealed letters appears to have been as closely studied in antiquity as in our own day. While Greco-Egyptian magic provided specialized spells for the purpose,[44] simpler ways of performing the feat were likewise known. Hippolytus includes in his curious collection of recipes for parlor tricks (derived, as Wellmann[45] has shown, from earlier pagan sources) several methods of taking a cast of a seal, which when set constitutes a duplicate die; and Alexander of Abonoteichus is accused by Lucian of "working an oracle" by duplicating seals in this fashion. Lucian also knows of the still simpler plan of removing the seal intact with hot needles and later replacing it; and he mentions that yet other devices to the same end have been described by his friend Celsus in his treatise against the magicians.[46] We have here the most obvious explanation both of the Baalbek performance and of the hocus-pocus with a sealed vessel (analogous to modern "slate-writing") which appears to have been practiced at the Apolline oracle of Korope in Thessaly.[47] Hence also, perhaps, if it ever took place, the successful experiment of that Governor of Cilicia who wrote privily on his tablets the question, "Shall I sacri-

[42] i. 47.
[43] *Saturn.* i. 23. 14 sq.
[44] *Papyri Graecae Magicae*, iii, 1. 371; v, 1. 301.
[45] *Die φυσικά des Bolos Demokritos* (Abh. Preuss. Akad. 1928), pp. 64 sqq.
[46] Lucian, *Alex.* 21.
[47] See the interesting inscription published in *Ath. Mitth.* 1882, p. 71, and quoted by Farnell, *Cults of the Greek States*, iv. 399.

fice to thee a white bull or a black?", sealed them, and sent them by a freedman to the oracle of Mopsus; the freedman, sleeping in the temple, heard in a dream the one word "black."[48]

The occasion of Croesus' test is apparently not the only one on which the Pythia succeeded in "understanding the dumb and hearing the unspoken word": Plutarch, whose evidence has special weight in relation to Delphi, says that "she is accustomed to deliver certain oracles instantly, even before the question is put."[49] A like claim is made by Tacitus for Claros: the priest on consultation days would merely inquire the names of the clients present and then, after retiring to a sacred grotto and there drinking the water of a certain fountain, would give appropriate replies in verse to their unspoken questions.[50] To assess the evidential value of such general statements is hardly possible, but it is unnecessary either to dismiss them as pure fabrications[51] or to assume that the managers of the oracles employed an army of private inquiry agents. If we may judge by the number of living persons who claim to have received relevant "messages" at anonymous sittings with "mediums" previously unknown to them, there is nothing impossible about the feat, whether we explain it by thought-reading, by the will to believe, or by some blend of the two. That the "enthusiasm" of the Pythia and similar personages was at bottom the same psychological condition (when we have allowed for the difference of the organizing belief-pattern) as the modern "mediumistic trance," seems to me reasonably certain: both states are auto-suggestively[52] induced, though not completely dependent on the subject's volition;[53] both are characterized by a temporary but profound disturbance of the sense of identity,[54]

[48] Plut. *Def. orac.* 45. The story seems to be a temple legend: the speaker in Plutarch's dialogue claims to have heard it when he visited the oracle in question. Cf. Lucian, *Philopseud.* 38.

[49] *de Garrulitate* 20. The ordinary practice at Delphi was to submit written questions, according to a scholiast on Aristophanes (*Plut.* 39).

[50] *Ann.* ii. 54.

[51] This is what Farnell does (*Cults*, iv. 189, 225). But the passage which he quotes from Ovid does not disprove Tacitus' statement: it merely shows that consultation by letter was admissible in lieu of personal attendance.

[52] Since the excavations at Delphi and the publication of Oppé's article (*Journal of Hellenic Studies* xxiv. 214 sqq.), the legend of the Delphic "vapors" may be dismissed as a product of rationalizing theory.

[53] Plut., *Def. orac.* 51, says that "the inspiring force does not affect everybody alike, nor does it always affect the same people in the same way."

[54] The use of the first person in Delphic utterances, even if it became a matter of convention, is intelligible only on the supposition that the god was believed to control the Pythia's vocal organs and use them as his own.

together with strong mental excitement and a claim to supernormal knowledge; and both may be followed by amnesia.[55] Both, one must add, could easily be simulated: but Plutarch's grim story of the contemporary Pythia who began to speak with a hoarse voice and then rushed howling from the sanctuary, became insane, and died,[56] is good evidence that even in the days of the oracle's decadence the disturbance was sometimes genuine.

Oracles were occasionally consulted, as clairvoyants are to-day, concerning the whereabouts of missing objects: thus at Dodona one Agis "consults Zeus Naos and Dione about the rugs and pillows—did he lose them himself or did some outside person steal them?"[57] At oracles where "incubation" (sleeping in the temple) was practiced such questions might be answered in dreams.[58] Three narratives of clairvoyant dreams of this type are included in the Epidaurian temple record. In the first case (no. 24 Herzog) a boy named Aristocritus, from Halieis, has dived (or fallen) into the sea from a cliff, failed to effect a landing, and disappeared. His father sleeps in the temple, and in a dream Asclepius leads him to a certain spot and shows him that his son is there. Returning home, he identifies the spot, cuts a passage through the rock, and finds the boy on the seventh day (presumably dead, though the record refrains from saying so). In the second story (no. 46) a woman is looking for a treasure concealed by her late husband: the god tells her in a dream that "the treasure will be lying within the lion at noon in the month of Thargelion," and the hoard is eventually found to be buried at the spot where the shadow of a certain stone lion falls at noon at the date mentioned. No. 63 also concerns a missing sum of money, a deposit at Leucas which there is difficulty in tracing: Asclepius in a dream introduces the depositor to the ghost of the deceased trustee, "who revealed the spot, and told him that if he came to Leucas he would get the gold from his (the trustee's)

[55] Amnesia is definitely ascribed by Aristides (xlv. II sq., vol. ii, p. 13 Dind.) to the priestesses at Dodona.

[56] *Def. orac.* 51. I have seen an amateur "medium" break down during trance in a similar way, though without the same fatal results. The change of voice is characteristic also of "mediumistic" possession. For cases of possession terminating in death, see Oesterreich, *Possession*, pp. 93, 118 sqq. (Eng. trans.).

[57] Inscription in Carapanos, *Dodone*, p. 75 (pl. xxxvi. 2).

[58] Cf. the dream of Sophocles, in which Heracles revealed the name of the thief who had stolen some of the temple plate (Cicero, *de Div.* i. 25. 54).

sons." To these may be added a case of a different kind, no. 21, where the same (medical) dream is independently dreamt about the same time by a woman at Epidaurus and her daughter (the patient) at Sparta.

Probably few persons to-day would be satisfied with the crude view that the Epidaurian record is a wholesale forgery deliberately produced by the priests, or would assume with some of the earlier commentators that the patients were drugged, or hypnotized, or mistook waking for sleeping and a priest in fancy dress for the divine Healer: an explanation is to be sought rather in the analogy of medieval and modern religious faith-healing and the so-called "medical clairvoyance" of hysterical subjects.[59] But the record is not a first-hand document: Herzog has shown in an admirable study[60] that it is based partly on genuine votive tablets dedicated by patients —which might be elaborated and expanded in the process of incorporation[61]—partly on a temple tradition which had attracted to itself miracle-stories from many sources. Of the stories quoted in the previous paragraph, no. 46 is, as Blinkenberg and Herzog have pointed out, a widely diffused folk-tale which has attached itself to the tradition. On the other hand no. 24 looks like a genuine case: the names and local details are precise, and in fiction the boy would have been found alive. Herzog produces medieval German parallels, and one may add that the employment of clairvoyants to discover missing corpses is common to-day on the Continent. It is not necessary to regard the incident as supernormal: a subconscious inference from indications observed during the earlier search might well emerge in the symbolic form of the veridical dream. No. 21 has a parallel in Pap. Oxy. 1381[62] (second century A.D.), where the Egyptian healing god Imouthes appears simultaneously to the patient's mother in a waking vision and to the patient in a dream. In both stories the narrator's intention is evidently to exclude an inter-

[59] On medical clairvoyance see Myers, *Human Personality*, Appendix V. A. Augustine records an interesting and typical case, *de Gen. ad. litt.* xii. 17.

[60] *Die Wunderheilungen von Epidauros* (Philologus, Supplementband 22, Heft iii).

[61] No. I is a clear case of this (Herzog, p. 71).

[62] Re-edited by Manteuffel, *de Opusculis graecis Aegypti e papyris ostracis lapidibusque collectis* (Warsaw, 1930); translated and discussed in Nock, *Conversion*, pp. 86 sqq. For another story of a simultaneous dream, see Livy, viii. 6; for modern cases, *Journ. S. P. R.* iv. 220 sq.; vii. 104 sqq.; ix. 331 sq., etc.

pretation of the appearance as merely subjective; in both, if we take them as fact, the operation of a common will to healing in parent and child may provide a normal explanation. Finally, no. 63 is explained by Herzog as a folk-tale of the Honest Dead, which must originally have been associated with a necromantic dream-oracle, the mediation of Asclepius being a later addition. He brings it into connection with the story of Periander and Melissa (Hdt. v. 92); with a somewhat similar legend about the Christian Bishop Spyridon (Photius, *Bibl.* cod. 256, etc.); with Varro's[63] story of his uncle Corfidius, who when lying in a state of coma became aware supernormally of his brother's death, at or near the moment of its occurrence, and also of the place where the latter had secretly buried some gold; and lastly with Augustine's[64] story of the young man to whom his father revealed in a dream the whereabouts of a missing receipt. It may, I think, be doubted whether all these tales stand on the same footing. The story of Periander belongs unmistakably to folk-lore, and that of Spyridon to hagiology; but one's uncle is a less likely hero for a purely fictitious romance. We may suspect the "buried gold" as a secondary elaboration derived from a folk-motive, but the remainder of Varro's narrative belongs to a type for which abundant first-hand modern evidence exists, the dream or vision (usually of a near relative) coinciding with the death of the person seen. The experience of Corfidius is curiously like that attributed to the eighteenth-century American Quaker Thomas Say, who when lying comatose and supposedly dead had a clairvoyant apprehension of the deaths of no less than three other persons and of the circumstances attending the end of one of them.[65] In the Epidaurian case, too, secondary elaboration may have been at work on a real dream: that the depositor should dream of finding the trustee dead and recovering his money from the sons, is entirely natural; the only supernormal element lies in the vague words "he revealed the spot," and one must remember that the instability of dream-memories renders them peculiarly liable to unconscious dis-

[63] *Apud* Plin. *N. H.* vii. 177: reproduced in Granius Licinianus, xxviii, p. 7. Flemisch.

[64] *de Cura pro mortuis* II (13).

[65] *Journ. S. P. R.* xiii. 87 sqq. (The story was written down many years later by Say's son.) I am indebted for this and some other parallels to an unpublished thesis by Mr. F. T. Walton.

tortion in the light of waking belief. As for Augustine's story, it is second-hand and anonymous, though related to Augustine *pro certo*. It has, however, a striking recent parallel in the "Chaffin Will case" (*Proc. S. P. R.* xxxvi. 517 sqq.), which has figured in an American court of law and is certainly not a folk-tale. It may be added that Augustine, with characteristic caution and acumen, warns us against assuming too hastily that the source of the supernormal apprehension in such cases is necessarily the deceased person.

If the anecdotes which circulated in the waiting-rooms of oracles carry as a group no very strong conviction of authenticity, it would be futile to seek a possible basis of fact for the cases of extrasensory perception which figure in hagiological romances. We need not linger over the claim of Hermotimus of Clazomenae[66] to be regarded as the first practitioner of "traveling clairvoyance"; or over the sensational feats attributed to Apollonius of Tyana[67] and St. Benedict[68] by their respective biographers. When material of this character is excluded, the remaining evidence of extrasensory perception by private individuals is curiously scanty. Apart from the tradition about Democritus, there is very little trace, save at the crude level of the magical papyri, of any attempt at experiment. Aristotle, however, may have taken some interest in the clinical study of abnormal mental conditions: he is said to have examined for himself a case of catalepsy;[69] and a fragment of his pupil Clearchus[70] represents him as assisting at an experiment in psychic excursion induced during sleep[71] by means of a "magnetic wand." The subject's body appears to have been insensitive during the absence of the "soul," which on its return "relates the details." We are not told what these were, or whether they were subsequently verified; they were probably *not* visions of the other world, since Proclus quotes the

[66] Pliny, *N. H.* vii. 53 (52); Plut. *gen. Socr.* 22; Tert. *de Anima* 44, etc. Lucian, *Musc. Enc.* 7, calls his story a fable.

[67] Philostratus, *Vit. Apoll.* iv. 12; v. 24; viii. 26 sq.

[68] Gregory the Great, *Dialogues*, Book II, *passim*.

[69] Fragm. 42 Rose: perhaps from Clearchus.

[70] *Apud* Procl. *in Remp.* ii. 122. 22 sqq. This story probably comes from Clearchus' dialogue *On Sleep*, where it may have served to introduce a myth: if so, we cannot take it as claiming to be historically true.

[71] Jeanne Croissant, *Aristote et les Mystères*, p. 22, refers to it as a "séance d'hypnotisme." But there is no evidence that the subject was put to sleep by the experimenter.

case not as a parallel to the myth of Er but merely as proving that the soul can leave the body and return to it.

The type of spontaneous case which is most abundant in modern times, viz. dreams or hallucinations coinciding with the death or physical peril of the person seen, is represented in antiquity, so far as my knowledge goes, only by the above-mentioned Corfidius story, by the vision of Sosipatra in Eunapius,[72] by Apollonius' highly questionable vision of the death of Domitian,[73] and by the well-known tale of the Megarian innkeeper.[74] This last hardly merits the attention which historians of psychical research have lavished on it:[75] it is one of those nameless and dateless incidents, painfully familiar to the modern investigator, which are copied, with improvements, from one text-book into another;[76] the version quoted by Suidas from Chrysippus differs widely from Cicero's, to which in turn Valerius Maximus adds a few finishing touches.

More impressive is the case of Sosipatra, a Neoplatonist blue-stocking, who in the midst of addressing a meeting of philosophers abruptly fell silent, and then proceeded to describe an accident which was happening somewhere in the country (we must assume, at the same moment) to a relative and admirer of hers. "'What is this? My kinsman Philometor riding in a carriage! The carriage has been overturned in a rough place! His legs are in danger! Oh, the servants have got him out unharmed, except for cuts on the elbows and hands—not dangerous ones. And now he is being carried on a stretcher while he makes a lot of fuss.' That is what she said, and it was so. And so everybody knew that Sosipatra was omnipresent and, as the philosophers say about the gods, a witness of all that happens." It is a pity that this incident rests solely on the authority of Eunapius, a notorious amateur of the miraculous.

There are also a few cases where the issue of a battle is said to have been supernormally apprehended by a distant person before

[72] *Vitae Sophistarum* p. 470 Boiss.

[73] Dio Cassius, 67. 18; Philostratus, *Vit. Apoll.* viii. 26 sqq. Suetonius knows nothing of the story.

[74] Chrysippus *apud* Suid. s.v. τιμωροῦντες; Cicero, *de Div.* i. 27. 57; Val. Max. I. 7, ext. 3.

[75] It is gravely discussed by de Boismont, *On Hallucinations*, p. 176 sq.; Flammarion, *Haunted Houses*, pp. 44 sqq.; de Vesme, *Hist. du Spiritualisme Experimentale*, i. 349 sq., etc.

[76] According to Cicero it was "continually quoted by the Stoics."

the news could travel by ordinary means: besides the rumor at Mycale of the victory at Plataea (Hdt. ix. 100), we have the augural divination reported by Livy[77] to have been performed by his friend Gaius Cornelius at Patavium on the day of the battle of Pharsalus (this is transformed by Aulus Gellius[78] into an impressive case of visual clairvoyance); and the auditory hallucination by which John Hyrcanus was apprised of his sons' victory over Antiochus Cyzicenus.[79] The type seems to have been a recognized one by Aristotle's day: his example of an external event apprehended in a veridical dream is a sea-fight.[80]

The most careful and sober descriptions of supernormal occurrences which have come down to us from antiquity are those furnished by Augustine, who deserves a more honorable place in the history of psychical research than any other thinker between Aristotle and Kant.[81] One of his cases has already been quoted. Extrasensory perception may be involved in the following also:[82]

1. A case of apparent telepathic "rapport" between an hysterical patient and a priest who was in the habit of visiting him, being the only person who could keep him quiet during his attacks and persuade him to take nourishment.[83] The priest's home was twelve miles distant from the patient's, and the latter would habitually recognize the moment at which the priest was setting out to visit him, and would describe exactly all the stages of his journey, saying "Now he has got so far! now he has reached the farm! now he is

[77] *Apud* Plut. *Caes.* 47.
[78] *Noct. Att.* xv. 18.
[79] Josephus, *Archaeol.* xiii. 10 (18), 3, 7 Dind.
[80] *de Div. p. somn.* 463 a 2.
[81] Cf. W. Montgomery, "St. Augustine's attitude to Psychic Phenomena," *Hibbert Journal* xxv. 92 sqq.
[82] I have not included the celebrated story of the two Curmas (*de Cura* I2. 15). Although Augustine obtained the percipient's own story in this case, as well as corroborative testimony from other people, he must have been hoaxed by his informants: for the same tale appears a couple of centuries earlier in Lucian's *Philopseudes*, 25 (and a couple of centuries later in Pope Gregory's *Dialogues*, iv. 36). The names are different in the three versions, but the central incident is the same in all, and *in all the victim is a smith.* I can agree neither with Reitzenstein (*Hell. Wundererzählungen*, 6), who thinks that Augustine made the story contemporary by a "literary artifice"; nor with Rose (*Proc. Camb. Phil. Soc.* 1926, 13 sq.), who defends its genuineness.
[83] *de Genesi ad litteram* xii. 17 (Migne, xxxiv. 467 sqq.). Augustine calls the patient's malady "fever" as well as "insanity." But the special influence which the priest exercised over him during the attacks points to an illness of mental rather than physical character. For modern parallels see *Phantasms of the Living*, i. 251 sqq.

coming up to the house!" The hysteric was naturally supposed by his friends to be possessed by an unclean spirit, and the spirit got the credit for these "monitions of approach"; but Augustine prudently observes that "he may have been merely mad, and the possession an inference from the powers which he displayed." He eventually recovered, and his uncanny intuitions then ceased. The account has a genuine ring; but in Augustine's day it would not be easy to measure time-coincidences closely, and we do not know how far normal inference might enable the subject to forecast the priest's visits.

2. An unnamed person, whose truthfulness Augustine guarantees, told him that one night before going to rest he thought he saw a philosopher of his acquaintance come in and expound certain questions about Plato which on a previous occasion he had refused to answer. It appeared later that the philosopher had *dreamed* that night that he came to his friend's house and answered the questions.[84] A few well-authenticated cases of this "reciprocal" type have been recorded in modern times;[85] but modern phantasms are not reported as holding lengthy conversations with their hosts.

3. Finally, we have some interesting cases of extrasensory perception by a Carthaginian diviner named Albicerius which were witnessed by Augustine and his friends.[86] Augustine, while disapproving of Albicerius as a man of abandoned life, claims that he has demonstrated his supernormal powers in numberless instances extending over many years, though there have also been some failures. The following examples are given. *(a)* On an occasion when a spoon was missed, Augustine caused Albicerius to be informed simply that some one had lost something. The clairvoyant identified the missing object as a spoon, gave the owner's name, and correctly described the place where it would be found. It is not clear whether the spoon had been mislaid or stolen: on the former supposition the knowledge of its whereabouts might be in the sub-

[84] *Civ. Dei*, xviii. 18.

[85] *Phantasms of the Living*, chap. xvii; Podmore, *Apparitions and Thought-Transference*, pp. 298 sqq.

[86] *Contra Academicos* I. vi sq. (Migne, xxxii, 914 sq.).

conscious memory of its owner, and it would be possible to explain the whole incident by telepathy. The skeptic will doubtless assume collusion with servants. We may compare Varro's story[87] of Fabius' consultation of Nigidius Figulus on a similar occasion, when with the aid of certain boys placed under a spell ("carmine instincti") Nigidius was able to describe what had happened to a number of missing coins. The employment of professional clairvoyants to discover stolen money is referred to in a fragment of an Atellane by Pomponius.[88] *(b)* On an occasion when Augustine's friend Licentius was consulting him on another matter, the clairvoyant became mysteriously aware that part of his fee, which was being brought him by a slave, had been abstracted *en route*. The details given are hardly sufficient to establish the supernormal character of this incident. *(c)* Another friend of Augustine's, one Flaccianus, asked Albicerius as a test question what business he, Flaccianus, had been discussing lately. The clairvoyant told him correctly that he had been discussing the purchase of an estate, and to his great astonishment gave the name of the estate in question, "although," says Augustine, "the name was so out-of-the-way that Flaccianus could hardly remember it himself." The possibility of normal sources of information can scarcely be excluded here. *(d)* The fourth and last case is the strongest. A pupil of Augustine's asked Albicerius to tell him of what he (the pupil) was thinking. Albicerius replied correctly that he was thinking of a line of Vergil, and proceeded promptly and confidently, although he was a man of very slight education, to quote the verse. If this is accurately reported, the skeptic will, I suppose, fall back on the hypothesis of unconscious whispering. It does not appear what methods Albicerius used, or what explanation he himself gave of his remarkable powers. Flaccianus, we are told, used to put them down to the admonition of some "low-grade spirit," *abiectissima animula*.

The survey I have given does not pretend to be exhaustive. But it has I hope served to illustrate both the differences between the

[87] *Apud* Apul. *Apol.* 42.

[88] Ribbeck, *Com. Rom. fragm.*,[3] v. 109. Pomponius may be gibing at Nigidius (Reitzenstein, *Hellenistische Mysterienreligionen*,[3] pp. 236 sqq.).

ancient and the modern evidence on these matters—differences largely conditioned by the dissimilarity of the theoretical approach—and the indications of a possible underlying identity in certain of the facts described. For the rest, I can only echo the words of Augustine—"if any one can trace the causes and modes of operation of these visions and divinations and really understand them, I had rather hear his views than be expected to discuss the subject myself."[89]

[89] *de Genesi ad litteram*, xii. 18.

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BOOK REVIEW

ESP AS CONFIRMING ORGANISMIC PHILOSOPHIES

By Homer H. Dubs

Professor Oliver L. Reiser of the University of Pittsburgh has repeatedly worked ESP into his philosophic books and articles. Now he has produced what is essentially a tract for the times, *The World Sensorium, The Social Embryology of World Federation* (Avalon Press, Inc., 1946, $3.00), in which paranormal psychical functions are given an important place in metaphysical reality. He makes use of a theory propounded by the late Dr. C. Hilton Rice. The latter's work has unfortunately remained incomplete and unpublished so that his speculations have not become widely known. His metaphysical theory is to the reviewer the most exciting part of the book, for here, for the first time, an organismic theory of nature is worked out in some detail with confirmation by an empirical phenomenon—the confirmation coming from ESP.

The biological world, according to Dr. Rice, is a great Organism, in which human beings are cells. A bodily organ is merely a nest of cells, and cells themselves are individual organisms. Similarly, all living beings constitute cells in one super-Organism. The organic kingdom evolved like an organism and functions like an organism. Plants and animals act in functional opposition, as do the two layers of the gastrula, so that neither can exist without the other. They function as tissues and organs in this huge Organism. The organic kingdom is, then, no crazy quilt pattern of "species," or aimless lines of life, but a co-ordinated whole in which every type of organism functions to preserve the whole. Biological evolution is the embryological development of this Organism, like the predetermined development of an egg. The first cell carried within itself the genes for the development of all types of plants and animals. Man represents a mutation that makes him the developing, conscious center which will control the whole. By "man" Dr. Rice does not, how-

ever, mean human individuals, but the *group mind,* which endures and does not die, while individuals pass away. Individual human brains are merely differentiating neuroblasts in the giant social brain. This still embryonic social mind, this superhuman Person developed in biological evolution, manifests its early stages of being through startling, uncontrolled flashes of perception by a mode other than sensory. Clairvoyance and telepathy are, then, evidences of a predetermined evolutionary mutation, which will eventually make of the whole universe a single unitary biologic organism in which all plants and animals are organs and in which the human minds are neuroblasts in a single social mind.

Dr. Rice's theory thus places ESP in a metaphysical setting and accounts for its existence and functioning. He interprets plants and animals in terms of cosmic embryology and physiology, and thinks of God as the adult Person who brought about this cosmic evolution and of the energies of the inorganic world as adjusted to the long life of the Organism. ESP does not, however, occur early in the evolutionary process, but comes only late, when the social mind has begun to develop. Dr. Rice predicts for the future tremendous psychic powers yet to be realized. Here is a bold and interesting metaphysical theory which makes ESP an important proof for a future super-individual mind and Organism.

Prof. Reiser takes over this theory, but places it in an indeterministic and emergent evolutionary metaphysics. "The human race" is "the head-end of a giant embryo which is progressing toward the fulfillment of its biological destiny," with ESP "as the precursor of the circulatory processes [*sic*] of such a being." ESP may be accounted for by a psychic ether which is emerging from a synthesis of human mental fields.

But Prof. Reiser is not content with ESP as an organic means of bringing about the emergence of a real world organism. He is anxious to establish a world state, with an International Institute of Cultural Collaboration or Institute of Scientific Humanism to integrate research in science and creative work in the arts and philosophy, thus organizing a planetary civilization with a universal ethics. In this process, America is the matrix of Planetary Democracy. Prof. Reiser speaks of radar, television, and radio as "elec-

tronic nerves" which are proliferating into a "planetary net-work of intercommunicating ganglia," thereby forming a world federation of states or nations.

Here he has two different means of integrating the world—one by organic super-individual "planetary encephalograms" of which ESP is merely a precursor, the other by electromagnetic waves from broadcasting stations engineered by human intelligence. World unity is to be achieved by the first of these means, but the other is also needed. Unless a mutation has some "social value" in the sense that it is used by society, that mutation will disappear. [But if the social mind has not yet emerged, how can there be any use of a mutation by "society"? And if the social mind has emerged, how can it fail to utilize itself?] So intelligent planning and effort, as exemplified by world broadcasts, are needed; humanity should not merely wait for the mutation of a cosmic pattern for "planetary brain-waves" to be produced by "the morphogenetic fields of force" existing in "the sun-earth-organism hook-up." Prof. Reiser is planning to take the kingdom of heaven by force. Although the "World Brain" which is to serve "as the vehicle of the planetary society" must evolve and cosmic fields of force will generate the "emerging super-organism," yet men need also in preparation to bring social wisdom and scientific power together to achieve integration of human relationships. We should look forward to a "planetary democracy." But there is no democracy within the human organism, only a dictatorship of the mind over the voluntary activities of the body. Prof. Reiser should decide which he wants: a democracy based upon the free consent of individuals or a dictatorship resulting from an organic subordination of body to mind.

As a matter of fact, Prof. Reiser seems plainly to envisage the latter, even though he calls it a "democracy," just as our Russian friends call their dictatorship "democratic." Prof. Reiser looks for the "socialized state: a planned economy," directed by a "world brain," which "will correspond to the World Cortex of the social organism," an organ for mobilizing energies, unifying programs, and providing a "master reaction." *"Society must get a head,"* [his italics]. The members of the Institute of Scientific Humanism,

which Prof. Reiser envisages as the directing organ of humanity, are to be chosen, not by the free consent of co-operating peoples as their representatives, but "in fact have already chosen themselves—by their character qualities." His "planetary democracy" is but another name for fascism or communism—a world dictatorship by "scientific humanists." Dr. Rice's deterministic world-organism could be endured, because it is inevitable; but Prof. Reiser's deliberately planned "bending the curve of social change" towards "planetary integration" under a self-chosen "Council, as an initial planning board" is something that no free man can tolerate.

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GLOSSARY

In order to avoid constant redefining of commonly recurring terms in papers appearing in this JOURNAL, the following definitions are submitted for convenient reference.

*For a simple description of those terms marked by an asterisk, as they apply to the ESP test data, see Chapter VIII and the Appendix of *A Handbook for Testing Extra-Sensory Perception* by C. E. Stuart and J. G. Pratt. Further explanation may be found in any elementary statistical text.

AGENT: In tests for telepathy, the person whose mental states are to be apprehended by the percipient. In GESP tests, the person who looks at the stimulus object.

AVERAGE SCORE: Average number of hits per run.

CALL v.: To attempt to identify by ESP a stimulus object or a mental state of an agent.

CALL n.: The response described above; also the resulting selection.

*CHANCE: The complex of undefined causal factors irrelevant to the purpose at hand.
CHANCE EXPECTATION = MEAN CHANCE EXPECTATION: The most likely score if only chance obtains.
CHANCE AVERAGE: Mean chance expectation expressed as an expected score, generally in terms of average per run.

CHI-SQUARE: A sum of quantities each of which is a deviation squared divided by an expected value. Also a sum of the squares of CR's.

CLAIRVOYANCE: Extrasensory perception of objective events as distinguished from telepathic perception of the mental state of another person.

*CR (CRITICAL RATIO): A measure to determine whether or not the observed deviation is significantly greater than the expected random fluctuation about the average. The CR is obtained by dividing the observed deviation by the standard deviation. (The probability of a given CR may be obtained by consulting tables of the probability integral, such as Pearson's.)
CR OF THE DIFFERENCE: The observed difference between the average scores of two samples of data divided by the standard deviation of the difference.

DECK: Twenty-five ESP cards, five of each suit.

*DEVIATION: The amount an observed number of hits or an average score varies from the mean chance expectation or chance average. A deviation may be total (for a series of runs) or average (per run).

DIE THROW: The elementary unit of data in a dice-throwing test represented by the throwing and reading of a single die, no matter how many dice are thrown at a time.

EMPIRICAL CONTROL: An experiment which wholly or partially follows the main experiment with the exception that the conditions are designed to exclude the possibility of the hypothesis being tested.

ESP (EXTRASENSORY PERCEPTION): Response to an external event not presented to any known sense.

ESP CARDS: Cards, each bearing one of the following five symbols: star, circle, three parallel wavy lines (called "waves"), square, plus.

ESP SYMBOLS: See plate opposite page 1, this JOURNAL, Vol. 1, March, 1937.

EXPECTATION; see CHANCE.

EXTRACHANCE: Not due to chance alone.

FREE MATERIAL: The stimulus objects of experiments in which an unlimited or unspecified range of stimulus objects is employed (as contrasted with methods such as card-calling in which the subject knows that the stimulus object is one of a known range).

FREE RESPONSE METHOD: An ESP test method in which a relatively unlimited range of stimulus objects is used and in which the subject is instructed to express freely as his response any range of thoughts and ideas.

GESP (GENERAL EXTRASENSORY PERCEPTION): A technique designed to test the occurrence of extrasensory perception, permitting either telepathy or clairvoyance or both to operate.

HIGH-DICE TEST: A PK technique in which the aim of the subject is to try to influence a pair of dice to fall with the two upper faces totaling eight or more.

LOW-DICE TEST: A PK technique in which the aim of the subject is to try to influence a pair of dice to fall with the two upper faces totaling six or less.

MEAN CHANCE EXPECTATION; see CHANCE.

*P (PROBABILITY): A mathematical estimate of the expected relative frequency of a given event if chance alone were operative.

PARAPSYCHOLOGY: A division of psychology dealing with those psychical effects which appear not to fall within the scope of what is at present recognized law.

PERCIPIENT: The person who makes the calls in an ESP test.

PK (PSYCHOKINESIS): The direct influence exerted on a physical system by a subject without any known intermediate physical energy or instrumentation.

PRECOGNITION: Cognition of a future event which could not be known through rational inference.

PREFERENTIAL MATCHING: A method of scoring free responses. A judge ranks the stimulus objects (usually in sets of four) with respect to their similarity to, or association with, each response; and/or he ranks the responses with respect to their similarity to, or association with, each stimulus object.

PSI: A general term to identify personal factors or processes in nature which transcend accepted laws. It approximates the popular use of the word "psychic" and the technical one, "parapsychical."

PSI PHENOMENA: Occurrences which result from the operation of psi. They include the phenomena of both ESP (including precognition) and PK.

QD (QUARTER DISTRIBUTION): The distribution of hits in the record page (or in a logical subdivision thereof, such as the set or the half-set) as found in the four equal quarters formed by dividing the selected unit horizontally and vertically.

RUN: A group of trials, usually the successive calling of a deck of 25 ESP cards or symbols. In PK tests, 24 single die throws regardless of the number of dice thrown at the same time.

SCORE: The number of hits made in one run.

TOTAL SCORE: Total of scores made in a given number of runs.

AVERAGE SCORE: Total score divided by number of runs.

*SD (STANDARD DEVIATION): Usually the theoretical root mean square of the deviations. It is obtained from the formula $\sqrt{npq}$, in which n is the number of single trials, p the probability of success per trial, and q the probability of failure. (For ESP cards, SD $= 2\sqrt{\text{no. of runs.}}$) Sometimes the SD used is that estimated from the observed variability in the scores.

SD OF THE DIFFERENCE: For both ESP cards and PK tests using dice, the SD of the difference is equal to $\sigma_s \sqrt{1/R_1 + 1/R_2}$ where σ_s is the SD of a single run and R_1 and R_2 are the number of the runs in the respective samples compared. This gives the SD of the difference for run score averages.

SERIES: Several runs or experimental sessions that are grouped in accordance with a stated principle.

SESSION: A unit of an ESP or PK experiment comprising all the trials of one test occasion.

SET: A subdivision of the record page serving as a scoring unit for a consecutive group of trials, usually for the same target.

SEVENS TEST: A PK technique in which the aim of the subject is to try to influence a pair of dice to fall with the two upper faces totaling seven.

*SIGNIFICANCE: A numerical result is significant when it equals or surpasses some criterion of degree of chance improbability. Common criteria are: a probability value of .01 or less, or a deviation in the expected direction such that the critical ratio is 2.33 or greater.

SINGLES TEST: A PK technique in which the aim of the subject is to try to influence dice to fall with a specified face up.

STIMULUS OBJECT: The ESP card or drawing or other object, some identifying characteristic of which is to be apprehended by the percipient.

TARGET: In ESP tests, the stimulus object; or in telepathy, the mental state of the agent. In PK tests, the faces of the die (or combination of faces) which the subject attempts to bring up in the act of throwing.

TARGET CARD: The card which the percipient is attempting to perceive (i.e., to identify or otherwise indicate a knowledge of).

SUBJECT: The person who is experimented upon. In ESP tests, most commonly the percipient (though also the agent in GESP and telepathy). In PK tests, any individual whose task it is to influence the objects thrown.

TARGET DECK: The deck of cards the order of which the subject is attempting to identify.

TARGET FACE: The face on the die which the subject tries to turn up as a consequence of direct mental action.

TELEPATHY: Extrasensory perception of the mental activities of another person. It does not include the clairvoyant perception of objective events.

TRIAL: In ESP tests, a single attempt to identify a stimulus object. In PK tests, a single throw of the dice or other objects thrown.

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