

## EXAMINATION OF ESP RECORDS FOR DISPLACEMENT EFFECTS

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CARINGTON (1) and Soal (8) have shown that often the extra-sensory faculty does not hit the intended object, but is displaced, just as a rifleman may hit to the right or left of a target. Using drawings as test material, Carington found that subjects' reproductions tended to correspond with or hit not only the originals for which they were intended, but even more so the other originals presented in the same series. This correspondence of drawings within a series was in marked contrast to the absence of displacement between series. Soal, using the ESP symbols on specially prepared cards, found two subjects who appeared to hit the card immediately preceding or succeeding the actual card for which they were aiming their call.

Displacements on the two sides of the actual target have been defined as "precognitive" and "postcognitive," and given minus (—) and plus (+) signs respectively. The use of these terms is questionable because we are not yet sure whether displacement is of a temporal or spatial nature, and these terms are usually associated with temporal aspects. However, since this terminology has been introduced by Carington and Soal, it will be retained here.

This paper is the first result of an effort to find displacement effects in some of the earlier ESP experiments which were done under good precautionary conditions and in which highly extra-chance results were obtained. The Pearce-Pratt (3), Warner (11), Riess A (6, 7) and Turner-Ownbey (5) distance series were selected for the study. These series are among those which constitute the very best evidence for extra-sensory perception (5), and therefore should be of interest in a quest for displacement effects. After these, four additional series with chance or near-chance results were examined: the Marchesi transoceanic series (4) was studied because of its salience,

and the Humphrey-Pratt GESP series (2) at the request of Dr. Pratt. The Riess B (6) and Zirkle-Ownbey (5) series were also included because they are cases of good subjects tested when they were not hitting the target.

Copies of the original records or journals in which they appear were supplied by Dr. J. B. Rhine of Duke University, under whose direction the work was carried out. Dr. Bernard Riess of Hunter College supplied the unpublished records of the Riess B series through private communication. Dr. Pratt supplied the records of his series, and along with Miss Agnes Snyder, assistant at the Duke Parapsychology Laboratory, aided in checking them. I am also appreciative of a grant from the McDougall Research Fund which aided financially.

The study of displacement in ESP from restricted test material may be made in a manner similar to that used by Soal. For tests with the ESP cards, the call and card record columns are placed alongside, and one moved relative to the other so that the calls no longer match the cards for which they were intended. There are  $s-1$  different "displacement runs" possible in each direction, where  $s$  is the number of trials in the normal run. In each of these there are  $s-|D|$  trials for each "displacement run," where  $|D|$  is the amount of displacement neglecting sign ( $\pm 1, \pm 2$ , etc.). A "displacement run," as used in this paper, will mean all the call-card matchings of a normal run in one displaced form. With the ESP cards there are  $24 \times 2$  displacement runs possible for each normal run, though one would hardly expect to find actual ESP displacement on any except those near the target. For the  $\pm 1$  displacement there are 24 trials, since one call and card at opposite ends of the run will be left unmatched. For the  $\pm 2$  displacement there are 23 trials, and for the  $\pm 3$  there are 22, etc.

A precognitive matching is one in which the cards are compared with calls preceding the calls actually intended for those cards. This gives the method for counting the displaced hits of a precognitive nature in which the subject may call cards before they have become targets. A postcognitive matching is one in which the cards are compared with calls succeeding the calls actually intended for those cards. In this way the postcognitive displacement hits in which the cards are called after they have become targets may be ascertained.

Since Soal chose his cards in a random fashion approaching the binomial and not from fixed decks, the probability of a displacement hit was the same as for a normal hit. However, the Pearce-Pratt, Riess, Marchesi, and Humphrey-Pratt series were done with fixed decks, and the Turner-Ownbey and Zirkle-Ownbey PT series are more on the order of fixed decks than the independently presented binomial.

For displacement runs with fixed decks the probability of a hit per trial is not necessarily exactly  $1/5$  for the ESP cards, but varies according to the hits on the actual target. This may be made clear from the following example. If a subject calls "circle" and the card *is* a circle, there are only four other circles in the card column distributed among 24 remaining cards for the circle call to hit in a displaced form. Thus the probability is  $4/24$  or  $.1667$ . But if the subject calls "cross" when the card is a circle, there are still five crosses distributed among the 24 remaining cards for the cross to hit in a displaced matching, and the probability is  $5/24$  or  $.2083$ .

These figures may be shown to be independent of which displacement is under observation. In a mass of data there will be both successes and failures on the target cards, so that a formula is proposed which is something of an average:

$$p_D = \frac{.1667r + .2083w}{t}$$

where  $p_D$  is the success probability per trial in a displacement series run, and  $r$ ,  $w$  and  $t$  are the number right, wrong, and number of trials respectively, in the normal run. In terms of number right and number of trials this may be rewritten

$$p_D = .2083 - \frac{.0416r}{t} \quad (1)$$

The value of  $p_D$  ranges from  $.2083$  where there are no target hits, through  $.200$  when the score on the normal runs is exactly chance, to  $.1667$  for maximum target success. It must be remembered that most experiments are composed of many runs instead of only one and that  $r$  and  $t$  then represent the number right and number of trials in the entire experiment, obtained by totaling the hits and trials respectively of each normal run.

A formula which would be applicable to the study of displacement

in decks other than the ESP cards may be derived along the same lines of reasoning. The value of  $p_D$  may be obtained for any size of fixed deck and any number of choices in restricted test material.

$$p_D = \frac{Sp - r}{t(S-1)} \quad (II)$$

where  $S$  is the size of fixed deck, and  $p$  is any probability per trial in the normal runs. Usually the number of cards in the deck is the same as the trials per run and  $S=t$ .

Examples of the use of formula (I) are as follows: For the Pearce-Pratt A, B, C and D series there are 558 hits in 74 runs so that

$$p_D = .2083 - \frac{.0416 \times 558}{74 \times 25} = .1958$$

while there are 1,348 hits in 74 Riess A runs.

$$p_D = .2083 - \frac{.0416 \times 1348}{74 \times 25} = .1780$$

It is hardly necessary to point out the fatality of using .200 for the displacement probability in the latter series. As a mythical example of the use of formula (II) suppose a subject calling 5 runs with a fixed deck of 10 cards, each bearing a number from 1 to 10, makes 20 hits. What is the probability of a hit in a displacement matching?

$$p_D = \frac{10 \times 50 \times .1 - 20}{50 \times 9} = .0667$$

This more general formula will not find extensive use in this paper, but it has been given for any future reference which may be desired. It is proper, however, to use it in the Humphrey-Pratt series where oddly enough the size of the fixed decks was 50 cards, although the runs themselves are in columns of 25 trials. But in that series the corrected probability is so little changed as to make little difference.

With the value of  $p_D$  known, the mean chance expectation,  $p_D^t D$ , is equal to  $p_D R(s-|D|)$  where  $t_D$  is the number of trials or displacement matchings,  $R$  the number of runs, and  $|D|$  the displacement number neglecting sign. The target mean chance expectation is  $sRp_T$  where  $p_T$  is the reciprocal of the number of choices. The

critical ratios are calculated by  $CR_D = \frac{d}{\sqrt{R(s-|D|)(p_D^t D)}}$  and

$CR_T = \frac{d}{\sqrt{(tpq)_T}}$ , where  $d$  is the deviation from the mean chance expectation and  $T$  represents the target or normal run. For the ESP cards  $s=25$  (a figure which still holds true in the Humphrey-Pratt series in this formula, because although the fixed decks had 50 cards, the displacement study was made on the runs of 25).

The Warner series was not conducted with a fixed deck, and each target card was chosen by making a fresh cut in a shuffled deck. Therefore  $p_D = p_T = .200$ . The 250 trials were done as one run, however, so that the number of trials in each displacement run is therefore  $250 - |D|$ .

There should certainly be no objection to using the normal run as the standard in computing the corrected mean chance expectations for the displacement runs when the result of the normal run is highly extra-chance above the theoretical mean. For a result far below the theoretical mean, the correction is usually too small to be of any real consequence. Even if there were no hits at all in the normal runs of the entire experiment, the  $p$ -value would (for the ESP card deck) change only from .200 to .2083. And, moreover, when the result of the normal run is chance or near-chance the correction is so extremely small as to be unimportant. For example,  $r$  may be substituted for by  $r \pm .667 \sqrt{tpq}$  which allows for a chance fluctuation of one average error. Then formula (I) becomes

$$p_D = .2083 - \frac{.0416 (r \pm .667 \sqrt{tpq})}{t}$$

and it follows that  $\Delta p_D = \pm \frac{.0111}{\sqrt{t}}$

where  $\Delta p_D$  represents the fluctuation error in  $p_D$  resulting from one average error of chance fluctuation in the value of  $r$ . For a short series like the Riess B series of 250 trials,  $\Delta p_D = \pm .0007$  which for a  $p_D$  in the vicinity of .2 is an error of only  $3\frac{1}{2}$  parts per thousand. For a long series like the Marchesi with 8,825 trials,  $\Delta p_D = .00012$  with an error of six parts per ten thousand. Even if the deviations of the displacement matchings are found to be greater than the deviation of the normal runs, it must be remembered that we are not interested in what result is obtained on the target, but conversely what may have been displaced. Therefore the target or normal run is the standard,

and correction must be made for its deviation before the displacements can be examined. Even though in some cases the correction is small, it seems best to follow the rule throughout.

The following tables give the displacement results obtained by carefully counting the hits of the displacement runs of the Pearce-Pratt, Warner, Riess, Ownbey-Turner, Zirkle-Ownbey, Marchesi, and Humphrey-Pratt series. The Pearce-Pratt series has been checked through all 24 precognitive and 24 postcognitive displacements. However, it seems unnecessary to check so far beyond the actual target, and the other series are confined up through  $\pm 5$  displacements. The checking has been done at least twice for each series, and in some instances gone over a third time. On the basis of the errors found on the subsequent checks, the present accuracy is now calculated to be 99.5%.

No significance appears in any displacement computed in any series, except in the +2 displacement of the Riess B series where

PEARCE-PRATT DISPLACEMENT MATCHINGS

PRECOGNITIVE					POSTCOGNITIVE				
Place	Hits	MCE	Dev.	CR	Place	Hits	MCE	Dev.	CR
-24	12	14.5	- 2.5		+ 1	359	347.7	+11.3	
-23	28	29.0	- 1.0		+ 2	334	333.2	+ 0.8	
-22	33	43.5	-10.5	1.7	+ 3	310	318.8	- 8.8	
-21	51	58.0	- 7.0		+ 4	300	304.3	- 4.3	
-20	83	72.4	+10.6		+ 5	275	289.8	-14.8	
-19	90	86.9	+ 3.1		+ 6	254	275.3	-21.3	1.4
-18	102	101.4	+ 0.6		+ 7	252	260.8	- 8.8	
-17	121	115.9	+ 5.1		+ 8	255	246.3	+ 8.7	
-16	131	130.4	+ 0.6		+ 9	246	231.8	+14.2	
-15	156	144.9	+11.1		+10	217	217.3	- 0.3	
-14	172	159.4	+12.6		+11	187	202.8	-15.8	
-13	194	173.9	+20.1	1.7	+12	179	188.4	- 9.4	
-12	167	188.4	-21.4	1.7	+13	193	173.9	+19.1	1.6
-11	205	202.8	+ 2.2		+14	171	159.4	+11.6	
-10	221	217.3	+ 3.7		+15	150	144.9	+ 5.1	
- 9	203	231.8	-28.8	2.1	+16	126	130.4	- 4.4	
- 8	239	246.3	- 7.3		+17	100	115.9	-15.9	1.6
- 7	284	260.8	+23.2	1.6	+18	92	101.4	- 9.4	
- 6	280	275.3	+ 4.7		+19	85	86.9	- 1.9	
- 5	287	289.8	- 2.8		+20	77	72.4	+ 4.6	
- 4	312	304.3	+ 7.7		+21	56	58.0	- 2.0	
- 3	319	318.8	+ 0.2		+22	46	43.5	+ 2.5	
- 2	333	333.2	- 0.2		+23	30	29.0	+ 1.0	
- 1	359	347.7	+11.3		+24	15	14.5	+ 0.5	
0*	558	370.0	+188.0	10.7					

\* Zero represents the target.

## WARNER DISPLACEMENT MATCHINGS

Place	Hits	Trials	MCE	Dev.	CR
Precognitive					
-5	46	245	49.0	- 3.0	
-4	53	246	49.2	+ 3.8	
-3	58	247	49.4	+ 8.6	1.4
-2	44	248	49.6	- 5.6	
-1	47	249	49.8	- 2.8	
Target 0	93	250	50.0	+43.0	6.8
+1	51	249	49.8	+ 1.2	
+2	45	248	49.6	- 4.6	
+3	48	247	49.4	- 1.4	
+4	49	246	49.2	- 0.2	
+5	51	245	49.0	+ 2.0	
Postcognitive					

## RIESS "A" DISPLACEMENT MATCHINGS

Place	Hits	MCE	Dev.	CR
Precognitive				
-5	283	263.4	+ 19.6	1.3
-4	275	276.6	- 1.6	
-3	272	289.8	- 17.8	1.2
-2	301	303.0	- 2.0	
-1	325	316.1	+ 8.9	
Target 0	1348	370.0	+978.0	56.3
+1	325	316.1	+ 8.9	
+2	296	303.0	- 7.0	
+3	260	289.8	- 29.8	2.0
+4	280	276.6	+ 3.4	
+5	262	263.4	- 1.4	
Postcognitive				

## RIESS "B" DISPLACEMENT MATCHINGS

Place	Hits	MCE	Dev.	CR
Precognitive				
-5	38	39.9	- 1.9	
-4	38	41.9	- 3.9	
-3	45	43.9	+ 1.1	
-2	44	45.9	- 1.9	
-1	49	47.9	+ 1.1	
Target 0	53	50.0	+ 3.0	
+1	46	47.9	- 1.9	
+2	26	45.9	-19.9	3.3
+3	49	43.9	+ 5.1	
+4	47	41.9	+ 5.1	
+5	42	39.9	+ 2.1	
Postcognitive				

TURNER-OWNBEY DISPLACEMENT MATCHINGS

Place	Hits	MCE	Dev.	CR
Precognitive				
-5	61	50.7	+10.3	1.7
-4	42	53.2	-11.2	1.7
-3	54	55.7	- 1.7	
-2	42	58.3	-16.3	2.3
-1	54	60.8	- 6.8	
Target 0	105	65.0	+40.0	5.5
+1	61	60.8	+ 0.2	
+2	51	58.3	- 7.3	
+3	58	55.7	+ 2.3	
+4	55	53.2	+ 1.8	
+5	48	50.7	- 2.7	
Postcognitive				

ZIRKLE-OWNBEY DISPLACEMENT MATCHINGS

Place	Hits	MCE	Dev.	CR
Precognitive				
-5	50	51.8	- 1.8	
-4	55	54.3	+ 0.7	
-3	70	56.9	+13.1	1.9
-2	60	59.5	+ 0.5	
-1	62	62.1	- 0.1	
Target 0	72	65.0	+ 7.0	
+1	56	62.1	- 6.1	
+2	53	59.5	- 6.5	
+3	61	56.9	+ 4.1	
+4	58	54.3	+ 3.7	
+5	55	51.8	+ 3.2	
Postcognitive				

SECTION I, MARCHESI DISPLACEMENT MATCHINGS

Place	Hits	MCE	Dev.	CR
Precognitive				
-5	1389	1411.3	-22.3	
-4	1547	1481.9	+65.1	1.9
-3	1588	1552.4	+35.6	
-2	1578	1623.0	-45.0	
-1	1693	1693.6	- 0.6	
Target 0	1788	1765.0	+23.0	
+1	1683	1693.6	-10.6	
+2	1639	1623.0	+16.0	
+3	1520	1552.4	-32.4	
+4	1494	1481.9	+12.1	
+5	1354	1411.3	-57.3	1.7
Postcognitive				



## HUMPHREY-PRAIT GESP DISPLACEMENT MATCHINGS

Place	Hits	MCE	Dev.	CR
Precognitive				
-5	1490	1528.5	-38.5	1.1
-4	1614	1605.0	+ 9.0	
-3	1684	1681.4	+ 2.6	
-2	1837	1757.8	+79.2	2.1
-1	1838	1834.2	+ 3.8	
Target 0	1877	1910.0	-33.0	
+1	1795	1834.2	-39.2	
+2	1792	1757.8	+34.2	
+3	1756	1681.4	+74.6	2.0
+4	1552	1605.0	-53.0	1.4
+5	1456	1528.5	-72.5	2.1
Postcognitive				

the critical ratio is 3.3. Otherwise the critical ratios do not even reach 2.5, and in most cases are not worth calculating.

In a pool of all these results there is one significant figure, but it is at +5 which is not one of the important displacements near the target. There are no large positive deviations at  $\pm 1$  and the deviations at +2 and +3 are positive instead of negative.

## POOLED TOTALS

Place	Hits	MCE	Dev.	CR
Precognitive				
-5	3644	3684.4	- 40.4	0.7
-4	3936	3866.4	+ 69.6	1.3
-3	4090	4048.3	+ 41.7	0.7
-2	4239	4230.3	+ 8.7	0.2
-1	4427	4412.2	+ 14.8	0.2
Target 0	5895	4645.0	+1250.0	20.5
+1	4376	4412.2	- 36.2	0.6
+2	4236	4230.3	+ 5.7	0.1
+3	4062	4048.3	+ 13.7	0.2
+4	3835	3866.4	- 31.4	0.5
+5	3543	3684.4	- 141.4	2.6
Postcognitive				

The one bright spot is the fact that there is such an excess of precognitive over postcognitive hits. Of the former there are 23,108 and of the latter 22,783, a difference of 325. However, the Turner-Ownbey series was checked through  $\pm 13$  displacements, although given through only  $\pm 5$  in this paper. In order to prevent rejection of data unfavorable to a given conclusion it is necessary to add 317 more precognitive hits and 336 more postcognitive, so that in all there are

finally 23,425 precognitive and 23,119 postcognitive with a difference of 306. But there have been so many displacement matchings that the standard deviation for the evaluation of the difference is 193 and the critical ratio is insignificant at 1.59. Assuming that all the displacement trials or matchings are independent, the probability associated with this ratio is .06. In order to avoid the question of the independence of trials, there are eight series of which seven gave the excess on the expected side, and this gives a probability of .035.

With Soal's two subjects (8) the total precognitive hits (through -8) were 3,851 and the total postcognitive (through +8) were 3,673. Thouless (9), who prefers the term "temporal dislocation" instead of displacement, also finds a tendency in the direction of hitting ahead (10). Apparently he uses the plus sign to designate matching calls with cards yet to come up and the minus sign to designate matching calls with cards already passed. This is the reverse of the usual convention. The results of the present study bearing on this question are not yet conclusive, and a more extensive study would be desirable.

Although Soal found significant positive deviations at the  $\pm 1$  positions, these did not occur in the series examined for this study; and, accordingly, such displacement appears not to be common to all ESP results.

No suggestion of any such displaced ESP was found in any series unless it was in the Pearce-Pratt Subseries B as shown by the table below:

PEARCE-PRATT BY SUBSERIES

Subseries	Runs	TARGET					$\pm 1$ DISPLACEMENT		
		Hits	MCE	Dev.	CR	ESP Q*	Hits	MCE	Dev.
A.....	12	119	60	+ 59	8.4	24.6	106	110.5	- 4.5
B.....	44	295	220	+ 75	5.7	8.5	447	416.4	+30.6
C.....	12	88	60	+ 28	4.0	11.7	114	113.0	+ 1.0
D.....	6	56	30	+ 26	5.3	21.6	51	55.5	- 4.5
Totals.....	74	558	370	+188	10.7	12.7	718	695.4	+22.6

\* See A. A. FOSTER, "A perception ratio statistic for ESP tests." *J. Parapsychol.*, IV (1940), 320-325.

The B subseries shows a slight positive deviation, though it is insignificant, with a critical ratio of 1.7. It was in the first part of this subseries that Pearce did poorly on the actual target as revealed by

the low ESP Q. Therefore a grouping of the runs according to target scores was undertaken. It was found that in those runs with target scores of 3 and 4 there were positive deviations with significant critical ratios (2.5 and 3.4) for the  $+1$  displacement. A slight negative tendency was noted at  $\pm 1$  when the target scores reached 12. There may have been, therefore, a trace of displaced ESP at  $\pm 1$ , but it is obvious from the total data of each series examined for this paper that on the whole no such outstanding tendency of this kind of displacement exists.

In addition to positive deviations at  $\pm 1$ , Soal noted negative deviations at  $+2$  and  $+3$  of a similar magnitude. Here again the present study fails to agree. It might be mentioned that the large positive deviation at these positions conceals the negative deviation resulting from the other series examined. It might be argued that since the Humphrey-Pratt series has a negative deviation on the target, the  $+2$  and  $+3$  displacements might be expected to be reversed, but this kind of reasoning may well be too dangerous to use.

There is still the possibility that the negative deviations usually found at  $+2$  and  $+3$  are the result of change-of-call, for after an extra-sensory stimulus finds expression, the card or stimulus is forgotten, and new cards or symbols are often chosen. This naturally gives a deficiency of  $+2$  and  $+3$  displacement correspondences with the past target card. Soal does not think that the change-of-call idea is the whole story, and a point in his favor is the significant critical ratio of 3.3 at the  $+2$  matching of the Riess B series, while there is an apparently chance result on the target. But even so, the  $+2$  displacement matching is a direct measure of the correspondence of a delayed call with a past target card. This, if negative, must mean a rejection of what this card has just been, and calls for either conscious or unconscious knowledge of the card when it was up. It is probable, however, that the critical ratio of 3.3 in the Riess B series loses its significance in view of the large number of other critical ratios which are insignificant.

Now change-of-call (and repeat-of-call) may or may not be classed as true ESP displacement. If a subject changes his call every time, and often uses ESP to make hits, the  $\pm 1$  displacement matchings may show a negative deviation, and if a subject repeats his call too frequently, often using ESP to make hits in these repeated calls, the  $\pm 1$

displacement matchings may show a positive deviation. Yet such changes or repeats may not be considered as actual ESP displacement. Although we can see to it that cards are randomly presented, or so corrected, we cannot force a subject so to distribute his calls. How then can one distinguish between true displacement and a sizable deviation found on a displacement matching, but resulting from a change- (or repeat-) of-call habit? It is necessary to show that any apparent displacement of ESP as indicated by a very significant critical ratio is independent of the result on the target. One way would be to show that the score on the actual target is so close to chance that change- or repeat-of-call could not possibly be the factor producing significance on a nearby displacement matching. Or it could be shown that the deviation of the displacement matching was far greater in magnitude than the result on the actual target. A second possibility, though more complicated, would lie in trying to prove that the deviations on the target and those on the displacement come from different parts of the data, or are in some other way unrelated to one another.

In any event, however, good evidence for displacement should consist of high extra-chance results on at least one of the displacement matchings near the target. There is a difference between real evidence for the existence of displacement in perceptible and unmistakable abundance, and the possibility that there may be a trace, though not in sufficient quantity to outdistance deviations which could result from chance. It is remotely possible that there may be some displacement of minor nature in some of the series examined for this paper, but taken as a whole this displacement must be exceedingly small and of little importance in comparison with the huge positive result amassed on the actual target.

Certainly it is not my purpose to claim that displacement does not exist, nor to question the results of Carington and Soal. Actually, some of my own unpublished tests using drawings as material appear to show something suggestive of displacement. This report, however, is intended to show the essential lack of displacement, except for a possible trace, in a number of selected ESP series, some of which constitute the finest and most concentrated occurrence of ESP.

With the results contained herein, only conclusions as to lack of relationships may be drawn. In addition to what has already been said, it is certainly indicated that distance between the subject and the

object to be perceived is not a factor in the occurrence of displacement. The experimental results which have been examined for this paper were obtained under test conditions involving distances ranging from within the same building (Warner and Humphrey-Pratt) to hundreds and thousands of miles (Turner-Ownbey and Marchesi). Carington and Soal, both of whom reported displacement, had experimental conditions in distinct contrast to each other in so far as distance was concerned. Carington's distances were varied and in some cases were hundreds of miles. Soal had subject and agent in the same room.

Again we may guess that probably the GESP, PT, BT and DT technics are not *per se* important factors in displacement. The Warner, Riess and Humphrey-Pratt series were conducted by the first method, the Turner-Ownbey and Zirkle-Ownbey by the second, the Pearce-Pratt by the third, and the Marchesi by the fourth.

It would be desirable to have examination of more ESP records for displacement, both in restricted and unrestricted test material. Especially would it be interesting to find whether there is always an excess of precognitive over postcognitive hits, and if outstanding deviations can be found on the displacement matchings, can they be shown to be independent of the target result.

#### SUMMARY

Eight outstanding ESP experiments, the Pearce-Pratt, Warner, Riess A and B, Turner-Ownbey, Zirkle-Ownbey, Humphrey-Pratt and Marchesi series have been examined for displaced ESP. Exceedingly little or none at all was found at the  $\pm 1$  displacement matchings. It was not possible to confirm Soal's findings at  $+2$  and  $+3$  except by a remote interpretation. There is, however, an excess of precognitive over postcognitive hits, but it is not significant. On the whole the results indicate that displacement is not found in these ESP series.

Several negative relationships were drawn. Distance is probably not an important factor in displacement. Likewise, the various experimental technics, GESP, PT, BT, and DT all showed the same lack of displacement.

Some mathematical formulas have been given, and some com-

ments made on differentiation between true ESP displacement and change- or repeat-of-call habit.

REFERENCES

1. CARINGTON, W. Experiments with paranormal cognition of drawings. *Proc. S. P. R.*, 1940, 46, 34-151. Also *J. Parapsychol.*, 1940, 4, 1-129.
2. HUMPHREY, B. M., and PRATT, J. G. A comparison of five ESP test procedures. *J. Parapsychol.*, 1941, 5, 267-292
3. RHINE, J. B. Some selected experiments in extra-sensory perception. *J. Abnormal and Social Psychol.*, 1936, 31, 216-228.
4. RHINE, J. B., and HUMPHREY, B. M. A transoceanic ESP experiment. *J. Parapsychol.*, 1942, 6, 52-73.
5. RHINE, J. B., PRATT, J. G., STUART, C. E., and SMITH, B. M., with GREENWOOD, J. A. *Extra-Sensory Perception after Sixty Years*. New York: Henry Holt, 1940.
6. RIESS, B. F. A case of high scores in card-guessing at a distance. *J. Parapsychol.*, 1937, 1, 260-263.
7. ———. Further data from a case of high scores in card-guessing. *J. Parapsychol.*, 1939, 3, 79-84.
8. SOAL, S. G. Fresh light on card guessing—some new effects. *Proc. S. P. R.*, 1940, 46, 152-198.
9. THOULESS, R. H. Presidential address. *Proc. S. P. R.*, 1942, 47, 1-19.
10. ———. Experiments on paranormal guessing. *Brit. J. of Psychology*, 1942, 33, 15-27.
11. WARNER, L. A test case. *J. Parapsychol.*, 1937, 1, 234-238.