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G. E. MCCASLAND

University of Toronto

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Randomized Targets in Parapsychology

The report by Kendon Smith and Harry J. Canon on "A methodological refinement in the study of ESP, and negative findings" (1) is of interest in two respects. First, it reopens some questions about the use of random numbers in experimental work; and second, it challenges a series of experimental studies which for the most part have gone unchallenged. The central point at issue is whether properly safeguarded tests of extrasensory perception, in which stimulus materials are made by tables of "random numbers," are valid.

The authors state that some findings "raise the suspicion that tables of random numbers may not be entirely random; that such tables may, in some small degree, actually embody conventional preferred sequences of digits." So far as I know, absolute randomness has never been claimed, and it is theoretically difficult, in view of sampling theory, to see what the concept could mean. What is meant by preparing random numbers is that one takes pains that each digit be followed by each of the 10 digits in haphazard order. When, as is usually the case, hundreds of such digits are employed in making up "targets" for subjects to guess at, it is hard to see how such material, kept out of all known sources of knowledge of experimental subjects, could significantly coincide with the orders in which subjects make their guesses, except by a process that, by definition, is extrasensory. It is true and important that from time to time a subject may by chance alone call a few items that are related to the actual "target" order; and it is true that in control series, brief periods of such parallelism of subjects' calls with targets at which the subjects are not aiming is occasionally observed. This is what would be expected from the theory of probability. When one is dealing, as in the case of the Schmeidler experiments (2), with hundreds of thousands of experimental calls, it is hard to see what could be meant by saying that failure of randomness in the targets could be responsible for the positive findings consistently obtained in guessing experiments.

In the experimental work reported by Smith and Canon, there were two kinds of targets—a pair of squares in which the left-hand one was blackened, and a pair of squares in which the right-hand one was blackened. The only task for the subject was to guess in each case whether it was the left or the right square

that was blackened. This seems to have been an unfortunate choice of target material, since earlier work suggests that the right-left dimension of choice often means little in the type of visual or kinesthetic imagination involved. At least with pictorial material, reversal from right to left, as in a mirror, has been reported (3). This is not to suggest that it occurred here; only that no conclusion can safely be drawn from this type of target. The task involved, moreover, in making a choice of one out of two appears from some experimental work (4) to be sometimes too insensitive to mobilize the interests and energies of subjects in such experiments; the choice of one out of five seems, as in the work of Soal and Rhine, to be a more sensitive and suitable procedure.

It is of interest to know that there was no significant difference in the scoring levels of those who believed in and those who disbelieved in the reality of paranormal phenomena. Unfortunately, the method chosen by the experimenters is one that makes it difficult to compare the present findings with those of the extensive earlier work reported on this problem.

GARDNER MURPHY

Menninger Foundation, Topeka, Kansas

References

1. K. Smith and H. J. Canon, *Science*, **120**, 148 (1954).
2. G. R. Schmeidler and G. Murphy, *J. Exptl. Psychol.* **36**, 271 (1946).
3. R. Warcollier, *Experimental Telepathy* (Harper, New York, 1938).
4. S. G. Soal and F. Bateman, *Modern Experiments in Telepathy* (Yale Univ. Press, 1954), especially pp. 300-302.

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Slide Technique for Bacteriophage Typing of *Staphylococcus aureus*

The phage typing of *Staphylococcus aureus* has become a useful tool in epidemiology, particularly in tracing outbreaks of food poisoning. An agar-petri plate method for typing was devised by R. E. Williams and J. E. Rippon [*J. Hyg.* **50**, 320 (1952)]. An agar-slide method that is simpler and less expensive has been developed in this laboratory.

Twelve 14-mm paraffin rings are simultaneously placed on a serologic slide (2 by 3 in.) by means of an electric ring-making apparatus. (The slides are placed in wooden racks designed for the purpose. These racks may be stacked for convenience.) Nutrient agar (0.5 to 0.7 percent) that has been filtered is pipetted by an automatic serologic pipetting machine (cleaned but not sterilized) in approximately 0.2- to 0.25-ml quantities into each paraffin ring. The agar hardens immediately. One drop of a 24-hr nutrient broth culture of *Staphylococcus* from a 0.2-ml serologic pipette (approximately 0.03 ml) is placed on each agar convexity. The culture dries in 15 to 20 min. Then a similar drop of each phage to be tested is placed on each of the culture-on-agar preparations. After drying 15 to 20 min, each slide is placed in a sterile covered petri dish and incubated overnight at