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Knowledge in Depth

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Parapsychological Phenomena, Theories of

Parapsychological phenomena of two types have been described. They may be cognitive, as in the case of clairvoyance, telepathy, or precognition and prophecy; here one person is believed to have acquired knowledge of facts, of other people's thoughts, or of future events, without the use of the ordinary sensory channels—hence the term extrasensory perception (ESP), often used to designate these phenomena. Alternatively, parapsychological phenomena may be physical in character: the fall of dice or the dealing of cards is thought to be influenced by a person's "willing" them to fall in a certain way; or objects are moved, often in a violent fashion, by "poltergeists"; the term psychokinesis (PK effect) is often used in this connection. The general term psi has become established to denote all kinds of parapsychological phenomena. Scientific interest in the subject is of relatively recent origin, but belief in the reality of such phenomena has been widespread since the earliest recorded times. Before the rise of modern science the causation of all complex physical phenomena was very poorly understood, and hence appeals to nonmaterial agencies (ghosts, devils, angels, sorcerers and witches, warlocks, demons, mythological beings) took the place of a causal, scientific explanation. Even so, there were widespread debates about the reality of phenomena that obviously transcended the bounds of everyday happenings, such as veridical prophecies, as by the oracle of Delphi, or the revival of the dead. The field was an obvious one for charlatans to enter, and even outstanding scientists believed in the possibility of astrological prediction—Johannes Kepler, for instance, earned his living by casting horoscopes.

Even now, the very existence of parapsychological phenomena is still very much in dispute, although societies for the study of psychic phenomena, made up of eminent scientists and laymen, have been in existence for almost a century and although the subject has been studied by many academic departments in British, continental, and American universities, often by scientists of outstanding ability. The discussion has sometimes assumed emotional overtones, unsuitable to scientific discipline, and outspoken but contradictory opinions are still frequently voiced. Believers and nonbelievers in psi may base their belief or disbelief on what they consider to be the scientific evidence, on their personal experiences, or on some larger system of attitudes and values into which ESP does or does not fit. When such extreme and contradictory views are widely held, it is almost certain that the evidence is not conclusive either way and that confident conclusions are unlikely to be supported by a survey of all the known facts.

Extrasensory perception. While it is possible to differentiate various types of ESP, this differentiation is difficult to maintain experimentally because in any actual investigation the types tend to blend into each other. The terms used in this connection are as follows: (1) clairvoyance, defined as the perception of objects and events by paranormal means; (2) telepathy, defined as the perception of the thoughts and mental states (*e.g.*, emotions) of another person by paranormal means; (3) precognition, defined as the perception of some future event, which may be an act, a thought, or an emotion. Evidence regarding any of these three alleged types of phenomena may be by reference either to naturally occurring phenomena or to especially arranged experiments. The earlier investigations were almost exclusively of naturally occurring phenomena; it is only in the last half century that methods of experimental investigation have been elaborated.

Naturally occurring phenomena are quite diverse; they include prophetic dreams, other types of prophecy, thought reading, and allied events, which are frequently reported by normal and relatively disinterested people who are themselves surprised by the events that they recount. An unusual example is the case shown on British television of a middle-aged woman, Mrs. Rosemary Brown, who had had, as a girl, some slight musical tuition but had since then not practiced on the piano or shown

any interest in music; upon the death of her husband she suddenly claimed that famous musicians like Beethoven, Brahms, and Schubert had appeared to her and were dictating musical scores to her, which she took down. When these were shown to outstanding experts they agreed that had these scores been found in some derelict attic they would have been regarded as genuine; each was not simply reasonable pastiche but genuinely expressive of what was known of the composer's emotion and personality. Apparently even highly trained musical experts could not easily (if at all) have produced work of this calibre; how a simple working-class woman with very little musical training could have done so is baffling, particularly as she was never taught composition. On the other hand, the idea of the ghosts of these Germanic musicians queuing up to dictate their recent compositions to this woman in English is not appealing. The facts are undisputed; no obvious explanation is forthcoming. As such, the story is typical of many others.

Much work has been devoted to professional mediums, persons (usually female) who make a profession of parapsychological experiences; Mrs. Leonore Piper, an American, Mrs. G.O. Leonard, British, and many others provided material for numerous books and articles. Most mediums claim to be controlled by someone in the spirit realm who speaks and sometimes acts through them; these controls enable them to perform acts of clairvoyance, telepathy, and precognition and to put people in touch with departed relatives and friends. Many mediums have been exposed as frauds; whether this makes it likely that those not so exposed were simply lucky or whether they were genuine as opposed to the fakes is still the topic of controversy. It seems unlikely that the study of naturally occurring phenomena, whether involving normal people or mediums, can throw much light on the scientific problem itself. Odd events happen all the time and every day; unless the probability of a particular event's happening can be calculated with some accuracy, it is not possible to adduce it as meaningful evidence in favour of the occurrence of ESP. Many people have reported dreaming that a particular horse won the Derby, only to find that in fact this horse did win. This does not prove that these dreams were veridical; it is equally important to know how many people dreamed about other horses winning the Derby that did not in fact win. Suppose that there are 20 runners; if 100 people report dreaming the correct winner but 1,900 dream the incorrect winner, then clearly there is nothing to be explained. Unfortunately the people who dream about the wrong horse seldom come forward so that this control figure is not known. Without such knowledge nothing can be said about the reported accurate dreams; they may be precognitive, but the evidence is completely inconclusive. The same argument may be applied to most of the claims made for ESP under naturally occurring conditions. The verdict must be that it is not proved.

The experimental arrangement of conditions such that proof for or against ESP can be obtained is difficult; best known in such investigations is the work of the American Joseph Banks Rhine and his many collaborators and students. Much of this was done with the so-called Zener cards; these bear one of five symbols (cross, star, circle, wave, rectangle), and 25 of them make up a pack. The experimenter may shuffle a pack and put it on the table, hidden from the subject, who then has to try to guess the order of the cards (clairvoyance), or the experimenter may look at each card in turn and ask the subject to guess at which card he is looking (telepathy, or possibly a mixture of telepathy and clairvoyance). There are many ways of varying this procedure, and millions upon millions of guesses or calls have been made in many different countries and by many different people. The advantage of this procedure is twofold: (1) a perfectly foolproof experimental design can be formulated that excludes completely the possibility of sensory knowledge of the cards and which is repeatable by other experimenters; and (2) the probability of any particular score (number of correct matchings of cards and calls) can be calculated and evaluated according to standard statistical formulae. When this is done

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of ESP
tests

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ESP

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testing of
ESP

there emerge a number of studies where the probability of achieving the reported success in guessing correctly by chance is so small that it may be ruled out for all practical purposes. Such studies are typically of two kinds: (1) it is possible to find isolated individuals who score so highly that coincidence is ruled out; and (2) when groups of individuals are tested no one does *much* better than chance, but there is on balance a slight excess over chance that is statistically unlikely to happen. The most likely value in calling through a pack is five; this represents complete chance. If a talented person scores consistently around 15, he only has to run through three or four packs to make chance an unlikely explanation of his performance. If 100 people are tested and each person averages 5.5 correct calls, this means little for each person, but the excess adds up to a most unlikely total. Some of the most exceptionally high-scoring individuals have been discovered by the British mathematician S.G. Soal, but these are few and far between, and most work is done on large groups of subjects. Occasionally subjects persistently "recognize" not the card presented but that next to be presented; this may be evidence of precognition. Sometimes believers in ESP score positively, disbelievers negatively; when the scores are averaged they do not depart from chance, but, when they are separated according to the prior belief or disbelief of the subject in the existence of ESP, then scores significantly higher (for believers) and lower (for disbelievers) than chance are found. Many other detailed findings are reported in the experimental literature.

Criticism
of ESP
tests

Critics have argued about the experimental designs and about the statistical treatment. It seems clear that early experiments suffered from poor controls experimentally and that statistical analyses were subject to valid criticisms. This is not true of more recent work, and it would be difficult to fault either experimental design or statistical treatment of studies done in the last 20 years; the former has been investigated by the American Psychological Society, the latter by the American Statistical Society, and neither society made any adverse criticisms. Hence critics now tend either to throw doubt on the applicability of statistics to these phenomena or to claim that there was cheating on the part of the subject or the experimenter or both. No coherent and acceptable argument, in fact, has been put forward to show that statistical methods are not applicable to ESP work, although the possibility that negative conclusions will not be published and that positive ones will must make one doubtful about the exact values reported. But the reported values add up to such a large probability that every inhabitant of the earth would have to guess cards continually and unsuccessfully for many centuries in order to render the reported results insignificant. The question of cheating is not capable of rational discussion; no case of an academic ESP research worker actually cheating has in fact been reported, and the probability that this will happen on a large scale seems slight. Nevertheless, the possibility cannot be completely ruled out that there is a massive conspiracy on the part of a hundred or more respected psychologists and other research workers to defraud the public into believing in the reality of ESP phenomena that in reality do not exist, a conspiracy which in many cases would also have to involve their subjects. Why these people should expose themselves to the danger of being found out when their only reward for their work is that of being vilified is not made clear. If the hypothesis of widespread fraud is rejected, then the evidence for ESP is stronger than that for many tenuously supported psychological phenomena.

Psychokinesis. Here, too, there is need to distinguish between naturally occurring phenomena and experimentally arranged sessions. One of the best known of the former is the story of how D.D. Home, surrounded by witnesses, floated out of a third-story window and in at another—over 100 years ago. The event took place in Ashley House, London, in 1868, and was attested by Lord Adare, Lord Lindsay, and Captain Charles Wynne; possibly because of the high social standing of the witnesses this became the most famous of many such "proofs" of the existence of parapsychological faculties. Certainly

many scientists and public men accepted it as such; yet when the original accounts are consulted little remains of the mystery. Home went to room A, leaving his companions in room B; he was then seen outside the window of room B and finally arrived in room C, which was on the other side of room B to room A. It would have been easy for him to have made arrangements beforehand to enable him to appear outside the window of the room containing his friends, either by way of a plank or by swinging from a rope attached to the roof and hanging over the parapet. Every stage magician nowadays does more difficult tricks before larger audiences and under conditions of much brighter illumination. Reports of this kind are inherently unreliable, and the uncontrolled conditions under which they are gathered make them impossible to evaluate properly. Most psychologists realize the weakness of their unaided senses in giving veridical reports of happenings, particularly when these occur quickly, unexpectedly, under conditions of poor illumination, or when powerful emotions are involved; all these factors are at work in the majority of reported psychokinetic phenomena and make reports on them, even by trained scientists, unreliable and useless. Investigators who cannot explain every trick performed by stage magicians should consider themselves barred from investigating alleged psi phenomena.

Poltergeists constitute a particular class of agencies supposed to produce PK phenomena. What is reported to be happening is that furniture is moved, things are thrown, windows are broken and other, sometimes massive, rearrangements of physical objects take place. Loud noises may be made, but there is seldom any physical injury done to people. It is usually found that when poltergeists plague a house a young child is living in that house; whether poltergeists are attracted by children or whether children produce the phenomena is an open question. Efforts have been made to photograph such happenings and to record them by other means, but such efforts have not led to any notable results. It is still necessary to rely on personal reports, and for reasons already stated such reports are not on the whole acceptable as scientific evidence. Some serious students of the subject report themselves convinced that no natural explanation is possible of the phenomena they have observed, but this belief is not widely shared. What is curious is the similarity of the events in places separated by thousands of miles and by hundreds of years; the question remains of course whether this similarity is between different groups of poltergeists or between different children. No other PK effects are so extensive, involving such large expenditure of physical energy, as are the alleged efforts of the poltergeists, and it often seems quite beyond the capacity of children to produce such effects; some critics have suspected the help of more adult members of the family or even efforts made by outsiders having their own reasons for frightening the inhabitants.

Intermediate between accounts of poltergeist phenomena and serious experimental work on PK come studies like those done recently on Ted Serios, a poorly educated, hard drinking, ex-bellhop from Chicago who claimed to be able to produce "thoughtographs"—i.e., images on film under conditions when the physical objects whose pictures appeared on the film were not present and where all physical interference with the film by Serios had been prevented. Serios was brought to scientific notice by a psychoanalyst who later accompanied him around the country and argued forcibly that this phenomenon (fitful though it was—successful pictures were only rarely produced, even in lengthy sessions) provided the breakthrough so often demanded of parapsychologists. Scientists were asked to investigate Serios; they tended to complain that they were not allowed to arrange conditions in such a way that trickery was excluded. Two expert photographers, who also had experience of amateur conjuring, investigated Serios and showed that his performance could be imitated under conditions similar to those under which he worked, without the help of occult forces; when they tried to search Serios in order to find evidence that he was using certain physical agents, they were prevented from doing so by the psychoanalyst, whom they also found ignorant of simple

Poltergeists
and
children

Experimental investigation of PK effects

laws of photography and "naïve" in many ways. It is clear from their account that such studies of Serios as have been reported are far from being scientifically impregnable and leave ample leeway for natural ways of producing the phenomena; as is often the case with mediums, here too the excuse for not allowing certain precautions to be taken is that the medium (or Serios in this case) would not like it and would be upset and thus would not be able to function properly. Even stage magicians do not have to invoke such excuses. When conditions were indeed more rigorous, as when the two photographers investigated Serios, no thoughtographs were produced.

PK effects have been investigated experimentally by means of dice thrown at random, either by people or by mechanical means; the subject of the experiment "wills" the dice to come up high or low or with a particular face upwards, and as the probability of that happening is known, it is possible to calculate the departure from chance, very much as in the card guessing experiments. The results of much work in this field have been similar to those for ESP, but perhaps somewhat less impressive; positive results have been reported sufficiently often to make a strong case for the existence of PK, but the case is still not strong enough to convince all those who consider the evidence in favour of ESP sufficient. There is nothing wrong with the method, and, indeed, several ingenious variants on it have been used; it is simply that far fewer experiments have been done with it and that no really high-scoring subjects have yet appeared. Reliance therefore has to be placed on large numbers of marginally above-chance scoring subjects and the detailed statistical evaluation of their answers. Many gamblers, of course, are convinced of the reality of PK, as is shown in their obvious attempts to influence the fall of the dice by "willing"; this, of course, does not constitute evidence.

Theories of psi. Two difficulties with ESP and PK effects are that they (1) contradict orthodox scientific theories, notably those relating to space and time barriers, and (2) have not given rise to meaningful theories of their own. There are, indeed, so-called theories of psi, but these are mostly ad hoc and in any case do not serve the main function of a scientific theory, which is to guide research in a rigorous fashion. At best, these theories are philosophical attempts to integrate putative phenomena with some highly speculative version of "reality"; usually these theories are idealistic and opposed to materialistic views, and frequently theorists have simply used psi phenomena as a stick with which to beat materialists. Such theories as exist may be grouped as follows: (1) Physical theories. These suggest the existence of some as yet undiscovered form of energy that has produced the phenomena in question; such a form of energy would have to differ from all others by not obeying the inverse-square law, as simple physical distance does not seem to affect psi much. (According to the inverse-square law, one quantity varies inversely as the square of another; for example, light decreases by the square of its distance from its source.) (2) Field theories. These suggestions, not in essence very different from the physical theories, deal with fields of force in the language of Maxwell; essentially they fall into the same class and are subject to the same difficulties. (3) The collective unconscious. According to this theory, all minds participate in some mysterious, common, unconscious source of knowledge; and the unconscious portions of one mind may interact with those of another. Such an explanation raises more problems than it answers. The so-called theory of a subliminal self is perhaps little more than another variant of the collective unconscious type of theory; it encounters the same difficulties. (4) Projection hypothesis. This theory endows the mind with some powers that can act independently of the physical world but which can interact with it. Such a hypothesis simply asserts the facts and does little to explain them. Many other theories, similar in kind to those mentioned, could be cited, but none of them has gained wide acceptance, and none of them has been found useful by research workers. In short, the how and why of psi, assuming even that psi does in fact exist, are unknown.

One of the reasons for this state of affairs may be that

research workers have been obsessed by the need to prove the existence of psi and have neglected the need to investigate the effects of altering conditions. How much and precisely in what way is psi influenced by distance, by changes in the physical properties of the cards or dice used, by electric screening, by drugs administered to subjects, by learning, by state of mind, by rewards and punishments for correct or incorrect guessing? Extroverts seem to do better than introverts. Are there other personality traits that predispose subjects to do well or poorly? Until a certain amount of knowledge is available on these points (and some efforts are now being made to study these factors) theorizing is perhaps premature. Simple repetition of experiments is unlikely to convert unbelievers and has thus a limited usefulness; what is needed are parametric experiments of the kind suggested above.

Can it be said that the existence of psi has been proved? No simple answer can be given because different people require different standards of proof. In the sense that there is much experimental evidence, collected under sound and well-controlled conditions and properly analyzed statistically, which supports such a view, the answer must be that ESP certainly, and PK probably, does exist. If to prove the existence of psi it is necessary to have replicable phenomena that can be demonstrated with certainty and that behave according to certain well-known laws, the answer must be in the negative. This position is not unusual in science, particularly in the initial phases of research; stellar parallax was searched for but not definitively discovered for over 200 years, although it formed an essential part of Copernicus' heliocentric theory. Neutrinos, having no charge and hardly any mass, were difficult to find and pin down; antimatter has a similar shadowy existence. The best summing-up might be that very intriguing demonstrations have been given that suggest the existence of something outside the purview of orthodox physics and psychology but that no one has yet succeeded in bringing this something under adequate experimental control. Until this is done and until the ways in which this something responds to changed experimental conditions are known, and until it is possible to formulate quantitative theories that are not simply question begging, it would be unwise to claim any more. Certainly it is premature to look for proof of immortality or survival of the soul in experiments with dice and playing cards; neither is it reasonable to claim that these findings undermine modern science. The relevance of these phenomena to either cannot reasonably be discussed until a better understanding of their nature has been achieved—assuming always that they exist at all and are not the product of imagination, cheating, and chance. The probability that these factors are responsible for all that has been discovered is small, but it cannot be completely excluded.

BIBLIOGRAPHY. A popular account and discussion of the field is given in H.J. EYSENCK, *Sense and Nonsense in Psychology* (1957). A thorough review of the experimental literature, written from a point of view favourable to parapsychology, is K.R. RAO, *Experimental Parapsychology* (1966). It is complemented by C.E.M. HANSEL, *ESP: A Scientific Evaluation* (1966), a highly critical review. J. EISENBUD writes on *The World of Ted Serios: Thoughtographic Studies of an Extraordinary Mind* (1967); D.B. EISENDRATH, JR., and C. REYNOLDS give a critical account of their study, "Spend an Amazing Weekend with the Amazing Ted Serios," *Popular Photography* (Oct. 1967). A theory of parapsychology and descriptions of some famous mediums are presented in W. MCGREERY, *Science, Philosophy and ESP* (1967). Two works by parapsychologists discussing their own experiments are J.B. RHINE and J.G. PRATT, *Parapsychology: Frontier Science of the Mind* (1957); and S.G. SOAL and F. BATEMAN, *Modern Experiments in Telepathy* (1954). A philosophical approach is taken by C.D. BROAD in *Lectures on Psychical Research* (1962).

(H.J.E.)

Paris

Founded on the island where a natural north-south highway crosses the Seine River, some 233 miles (375 kilometres) upstream from the river mouth on the English Channel, Paris, the largest city proper of continental Europe and the capital of France, is over 2,000 years old.

