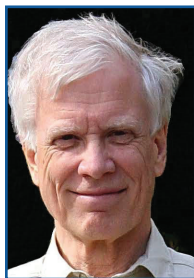


PARAPSYCHOLOGY: THE SEARCH SCIENCE LEFT BEHIND

BY JAMES E. ALCOCK



Direct mind-to-mind, “extrasensory,” communication with others no matter where they are in the world (telepathy). Seeing the future before it occurs (precognition). Moving an object simply by wishing it (psychokinesis). Changing the present by going back in time to modify the past (retro-psychokinesis). Improving task performance today by practising tomorrow (retro-causality). Leaving and returning to one’s body (out-of-body experiences). These and other putative “paranormal” (or “psi”) phenomena are the subject matter of parapsychology.

Parapsychologists consider themselves scientists conducting careful investigations of mind-matter interactions, and indeed, formal parapsychology has many of the features of normal science: professional organizations, journals and conferences; a large research literature; researchers with doctorates in traditional scientific fields; and courses offered in a few universities where some even award PhDs [1]. Moreover, a number of distinguished scientists have been involved in parapsychology across the decades, among them physicists Sir William Crookes, David Bohm, Robert Jahn (former Princeton University Dean of Engineering) and Nobel laureates Lord Raleigh, Wolfgang Pauli and Brian Josephson. Josephson turned to string theory to explain extrasensory perception (ESP) in terms of shared ‘thought bubbles’ generated out of a mental vacuum state [2]. However, it is important to note that none were drawn to the study of the paranormal by theoretical considerations or observations or anomalies emerging from their work as physicists. And just as important, none were trained to deal with the complexities and pitfalls of conducting research with human subjects.

Yet, even though parapsychologists have many times produced what they consider to be confirmatory evidence, they have never persuaded the larger scientific community that their phenomena actually exist. To understand this

impasse, one must go back to the beginnings of modern science and its rejection of supernaturalism.

THE RISE OF MODERN SCIENCE

Belief in the supernatural has played an important role in every civilization throughout history. In medieval Europe, God, heaven, soothsayers, witches, astrology, curses and charms were all part of a common worldview. At the same time, dogma, both sacred and secular, was generally accepted without challenge, and philosophers philosophized through logical analysis unencumbered by the constraints of actual data. It was in this context that modern science took its first steps in the 16th century when Copernicus’ heliocentric model, supported by data gathered by Galileo with his crude telescope, ultimately triumphed over the geocentric pronouncements of Aristotle, Ptolemy and the Roman Catholic Church. This ushered in a new approach to understanding nature in which systematic observation and logic were used to form theories which were then tested against data, with anomalous data playing the role of disruptor [3]. The 1687 publication of Isaac Newton’s *Philosophiae Naturalis Principia Mathematica* went a step further, demonstrating that there is a logical order to the world and that complex phenomena can be described in precise mathematical language corresponding with observation [4].

As modern science continued to develop, supernaturalism in its many forms — deities, discarnate spirits, mind-body dualism — was gradually expunged, resulting at times in pitched battles with religious orthodoxy. Science and organized religion eventually reached somewhat of a truce (although one might wonder, given contemporary efforts to ban the teaching of evolution from biology classes in some parts of the United States). Parapsychology is a remnant of the breakup between science and supernaturalism; its persistence reflects a continuing effort to demonstrate that “mind” can act independently of the brain and does not necessarily extinguish with the dying of the flesh.

SCIENCE AND THE PARANORMAL

Scientific discoveries in the 19th century, Darwin’s theory in particular, challenged biblical truths about the centrality of human beings in creation, and this roiled the minds of many scholars who had been reared with religious beliefs. Two paths diverged in the wood, but which to follow? Religion with its recognition of the soul and

SUMMARY

Parapsychologists claim to have established the reality of paranormal phenomena. However, because of fundamental problems with theory, methodology, and data interpretation, and the inability to provide a single demonstration replicable by neutral scientists, it is no more worthy of scientific status now than when science rejected it a century ago.

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post-mortem survival, or the materialistic, soulless, worldview offered by science?

The Society for Psychical Research (SPR) offered a middle road. It was launched in England in 1882 as a *scientific* organization dedicated to the exploration of paranormal phenomena and post-mortem survival. Its formation was very timely, for the Spiritualist movement was in its heyday, producing startling demonstrations of apparent communication with the dead that called out for serious appraisal. There was nothing particularly unscientific at the time in subjecting these reports to scientific scrutiny. After all, this was an era of astonishing discoveries of previously undetected energies, such as Roentgen's X rays, Hertz's radio waves, and Becquerel's radioactivity, and it was conceivable that other as yet undiscovered energies could account for mediumistic communication, telepathy, psychokinesis and other paranormal events.

The SPR was attractive to those who, like its founding president Cambridge philosopher Henry Sedgwick, were disillusioned with the mythological aspects of religion and yet distressed by the implications of the materialistic scientific worldview. (This conflict was experienced by other prominent figures in parapsychology down through the years, including Joseph Banks Rhine, the "grandfather of American parapsychology." Rhine viewed finding proof of telepathy as a stepping-stone towards proving the existence of the soul). Rather than standing in opposition to science, parapsychologists sought to operate *within* science. Thus, one foot in empiricism, the other in supernaturalism, parapsychology has from the beginning sought a sort of "secular" soul unfettered by mythological deities and demons.

The SPR began its work with the analysis of accounts of paranormal experiences, but anecdotal reports prove too unreliable to be useful, for whenever they could be checked against objective information, the errors of memory were obvious. Similarly, studies of mediums and other supposedly "gifted" individuals failed, most often because the individuals were caught cheating. In the 1930s, the obvious weaknesses of such naturalistic evidence pushed parapsychologists, led by Joseph Banks Rhine, into the laboratory in the hope that science — and the methodology of experimental psychology in particular — could finally establish the reality of paranormal phenomena.

However, because parapsychologists claim that paranormal influence cannot be blocked in any way, the use of traditional control groups is not possible. In their place, success in guessing experiments is compared with what would be expected by chance alone. A significant deviation, either positive or negative ("psi missing") is taken as evidence of paranormal influence. However, to automatically consider the cause to be paranormal is unjustifiable; statistical significance is silent as to its cause and one cannot distinguish between the effects of paranormal processes, flaws in the methodology, or even the intervention of some hypothetical deity.

What was gained by the move into the laboratory? Increased control over experimental conditions and data collection. What was lost? The emotionally-compelling and seemingly paranormal personal experiences that intrigued so many people were replaced by monotonous guessing tasks, with success determined by statistical deviations from chance expectation. And at the same time, parapsychologists had climbed onto a one-trick pony, seeking only evidence of the paranormal while ignoring psychological and neurological research into perception, memory and consciousness related to how such experiences can be understood in terms of normal brain processes [5]. Non-conscious cues, automatic causal associations, the distorting effects of coincidence on information processing, the influence of emotion on cognition, the inability of the conscious brain in certain circumstances to distinguish between information from the outside world and information arising from parts of the brain itself — such influences are likely at some time in each of our lives to produce powerful and strange experiences that seem paranormal.

PARAPSYCHOLOGY'S FAILED QUEST

Although parapsychologists strongly reject this conclusion, their efforts to find scientific evidence of paranormal phenomena over the past 150 years have been a dismal failure, and the evidence for the paranormal is as unconvincing now as it was in the 19th century. No reliable data have been produced. No consistent pattern of research findings has emerged. No well-articulated theory has been developed. And while every area of normal science shows progress over time — constructs, methods and procedures are refined, and effect sizes grow as a result of improved methodology — no such advancement has occurred. Methods once proclaimed to have demonstrated the reality of the paranormal have since been abandoned as inadequate. New methodologies emerge, often every decade or so, promising the long-awaited breakthrough, until they too eventually prove futile. Guessing tasks involving decks of cards and dice-rolling machines are replaced by random event generators driven by electronic noise or radioactive decay; or participants are placed in a sensory deprivation situation assumed to isolate the brain from extraneous sensory stimulation, supposedly improving the capability to respond to paranormal influence. Whatever the methodology, the goal of establishing the reality of paranormal is never reached. And while meta-analyses have become popular in recent years, they cannot overcome the methodological weaknesses of the studies upon which they are based.

There are a number of important reasons why parapsychologists' evidence has failed to persuade mainstream science [6]:

Negative definition of phenomena: Unlike any area of normal science, putative paranormal phenomena are only *negatively* defined: they are said to be observed only when all normal explanations can be ruled out. However, one can never be certain that all normal explanations — methodological shortcomings in

particular — have been identified and eliminated. In addition, constructs are so poorly defined that parapsychologists admit that they cannot always distinguish between them. For example, an event supposedly *foreseen* through precognition may have instead been *caused* by psychokinesis.

No limits, no boundaries: Parapsychologists inform us that paranormal influences are pervasive, unstoppable and have no limits. No physical means has ever been found to influence or block them. People cannot simply switch their ability on and off for the benefit of researchers, for paranormal processes can continue to act subconsciously. The effects can apparently manifest themselves just as strongly across tens of thousands of miles as across a room and operate backwards or forward in time as well. Their successful use requires no effort or training, nor even knowledge of a target or its location. And such powers can be wielded not only by humans but by animals and insects as well.

When *nothing at all* appears to modulate statistical deviations from chance in what are essentially guessing tasks, this suggests that there is no phenomenon to be studied, that these statistical “successes,” unaffected by situation or context, are what one might expect if they are simply due to methodological flaws [7]. And methodological weaknesses there are aplenty.

Methodological weaknesses. Despite the determined efforts of some researchers, methodological weaknesses continue to plague parapsychological research. Given the very small effect sizes produced over what is typically a very large number of trials, even minor methodological flaws are capable of producing significant departures from chance.

My own detailed analysis of a wide range of parapsychological research reports (including virtually all of that conducted by physicists Helmut Schmidt and Robert Jahn [8]) has not found any study free of important methodological flaws. And then there is the recent publication in a mainstream psychology journal of a major paper by Daryl Bem [9] reporting experiments trumpeted by many as clearly demonstrating the reality of the paranormal. This research was so riddled with blatant methodological flaws that it established nothing except the mystery of why it was ever accepted for publication [10].

The critic is often asked how one can be so critical if one has not carefully analyzed whatever is the very latest research paper. However, to examine each new research paper is extremely time-consuming and, even then, there is often insufficient detail to allow for the detection of methodological flaws and weaknesses. For example, a series of studies on “remote viewing” (a variant of telepathy) conducted by physicist Russell Targ and engineer Harold Puthoff [11] was presented as confirmatory evidence of paranormal phenomena. Weaknesses in the procedure were not evident in the paper itself, and it was only several years later that information was obtained that exposed

methodological flaws so serious that they later were shown to account for the reported paranormal effects [12].

Lack of replicability: Unlike any other research area deemed to be scientific, parapsychologists have never been able to provide even a single demonstration of a paranormal phenomenon that is replicable by neutral scientists. Undaunted, this huge failing is explained away in terms the *psi experimenter effect*, a convenient feature of the paranormal. If a neutral scientist cannot replicate a paranormal effect, this failure is attributed to the scientist, for it is claimed that any lack of confidence or any skepticism about the reality of the phenomenon interferes with its manifestation. Some go even further and suggest that “. . . the nature of the phenomenon may be intrinsically unsuitable for detection under controlled conditions [13].” The claim that outcomes are influenced by the attitudes and wishes of the researchers should be reason enough to conclude that parapsychology, whatever it is, is not a science.

Moreover, this lack of replicability increases vulnerability to fraud, allowing it to go undetected much more easily than in normal science. And fraud is a significant problem for parapsychology. One recent example: one quarter of the papers in a large meta-analysis [14] supposedly claiming to demonstrate paranormal influence, were authored by a parapsychologist who had earlier been caught red-handed with doctored data [15,16].

Lack of theory: Not only has parapsychology failed to produce reliable data, it has developed no coherent theory of its own. However, parapsychologists are drawn both to the “spookiness” of quantum mechanics [17] and the counter-intuitiveness of relativity theory in the hope that they will provide justification for paranormal claims. The Heisenberg uncertainty principle is taken to indicate that the mind of the observer interacts with matter directly, in line with parapsychological claims. Simultaneity in the theory of relativity is interpreted as allowing effect to precede cause, thereby enabling precognitive abilities. And it has been argued that the fundamental laws of nature do not have a preferred direction of time, and so this too allows for perceiving the past and the future with equal ease. Quantum entanglement and non-locality are interpreted to allow that information can be instantaneously transmitted from one part of the universe to another, as is claimed for telepathy. Such theoretical adventures can seem tantalizingly impressive, especially to the non-physicist, and the gainsaying of these claims by mainstream physicists falls upon deaf ears.

Wisdom dictates that before trying to explain a phenomenon, one should first be sure that there is a phenomenon to explain [18]. In the absence of reliable evidence of the paranormal, seeking theoretical explanation is at the very least premature. But this is not the kind of prematurity that can trigger a scientific revolution, for the “anomalies” of which parapsychologists speak never present themselves to anyone but parapsychologists.

Another strike against parapsychology is its failure to jibe with science at large. There is nothing in physics that violates the basic principles of biology. The science of genetics is not inconsistent with chemistry. Neurological findings do not conflict with physics. Parapsychology, on the other hand, is completely inconsistent with well-established principles in other areas of science. In fact, as psychologist Arthur Reber and I [19] have pointed out, paranormal phenomena are impossible if the current scientific worldview is correct. For example, paranormal phenomena apparently pay no heed to the laws of thermodynamics, given that minute biological brain activity supposedly can, through psychokinesis, bring about movements in physical objects that require significant amounts of energy. Further, parapsychologists claim both that distance has no effect on either telepathic transmission or psychokinetic processes, and that some currently nonexistent future state can physically influence the brain of a participant in a precognition experiment. (We recognize that scientists are often uncomfortable with describing the paranormal as “impossible,” and yet there is no such discomfort in regard to the impossibility of perpetual motion machines, or the “memory” of water in extremely highly diluted homeopathic preparations, or chemicals that convert lead into gold, or levitation during transcendental meditation).

And then there is the gross incompatibility with neurology and psychology. As one example, verbal communication is an extremely complex process mediated by a number of centres in the brain. Its mastery requires years of learning, and damage to any of the components of this complex system results in serious degradation. Telepathy apparently requires no such apparatus or training. And while deterioration in your functioning can lead to the disintegration of memory and personality associated with dementia, parapsychologists argue that “mind” is able to separate itself from the physical brain altogether and fully experience the world as though all of the brain’s sensory and cognitive functions are intact.

Such “impossibility” does not trouble parapsychologists, for as has been noted:

“... parapsychology remains tied to its historically conditioned adversary relationship with the natural sciences ... Achievements in the field therefore are important just to the extent that they are incompatible with, and as a result have revolutionary implications for, the modern scientific world picture.” [20]

THE SEARCH GOES ON...

Science turned its back on parapsychology because of lack of evidence that its subject matter is real. Physicists in the course of their normal research using ultrafine measurements of extremely

delicate phenomena never report “paranormal” anomalies, nor are such anomalies predicted by physical theory. Why then does the search for the paranormal survive when searches for other questionable phenomena end for lack of evidence? No modern scientist pursues alchemy. Phrenology, a supposed science based on measuring mental traits by examining bumps on the skull, died away for lack of empirical evidence. Interest in ether as the medium in which light is propagated dwindled away following Michelson and Morley’s failure to find supportive evidence. Yet, parapsychology continues.

Convinced that their phenomena are real, parapsychologists consider their research pursuits to be true to scientific ideals and feel ill-treated by the rejection of their claims by the supposed gatekeepers of scientific righteousness. They belong to a passionate community of like-minded researchers who share the reassuring perspective that minds and personalities are much more than mere epiphenomena of brain function that will vanish with the dying of the flesh. They are not flummoxed by the failures and inconsistencies in their research but instead explain them away in terms of ad-hoc effects. They are undeterred by criticism, even when it is from initially supportive colleagues. Consider this: A century ago, several distinguished experimental psychologists, after failing to find persuasive evidence of psi phenomena despite significant investments of time and effort, left the field, concluding that the phenomena do not exist. This had no impact on other researchers and their failures to find evidence were explained away. And in recent times, when physicist Stanley Jeffers [21] abandoned parapsychology after his failed attempts at replicating physicist Robert Jahn’s paranormal findings (with Jahn’s cooperation and support), this too had no impact on the field, and his failures were also explained away. And when psychologist Susan Blackmore, once a leading and highly valued parapsychologist, left the field after coming to doubt the existence of paranormal phenomena, this too had no effect. Instead, her credibility was questioned.

As a result, the parapsychological belief system is virtually unsailable, and parapsychology in one form or another is likely to endure, for it is belief in search of evidence rather than data in search of explanation [22]. New methodologies will be applied; fresh attempts to link the paranormal to quantum mechanics or other physical theories will be made; further claims of confirmatory evidence will be issued; and the quixotic quest will continue to capture the interest of a small number of dedicated researchers who strive to revolutionize science through their efforts. And their claims will continue to resonate with much of the public who, unaware of the myriad ways in which their own brains sometimes produce seemingly inexplicable experiences, find a paranormal explanation preferable to no explanation at all. *Plus ça change, plus c’est la même chose.*

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