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BOOK REVIEWS

SCIENCE AND PSYCHIC PHENOMENA: THE FALL OF THE HOUSE OF SKEPTICS by Chris Carter. Rochester, VT: Inner Traditions. 2012. Pp. xiii + 303. $18.95 (paperback). ISBN 978-1-59477-451-5.

This book is a revised edition of *Parapsychology and the Skeptics: A Scientific Argument for the Existence of ESP*, originally published in 2007.

This book presents a very judgmental black and white perspective of parapsychology: Virtually everything skeptics say is wrong, and virtually everything proponents of psi say is right. Carter says he wrote the book to challenge the most biased skeptical opinions about the existence of psi. The result is an almost equally biased book in favor of psi.

Those who realize that scientific progress often involves gray areas will need to look elsewhere for an objective, insightful presentation of the strengths and weaknesses of parapsychological methods and findings. This book takes the position that the evidence for psi is absolutely compelling and those who are skeptical of the methodology or findings are ignorant of the research, intellectually incompetent, or dishonest. This is the counterpoint of the skeptical writings that imply that those who believe in paranormal phenomena are intellectually deficient.

The judgmental black and white perspective is apparent in the discussion of meta-analyses. Following certain other proponents of experimental parapsychology, Carter considers meta-analyses as providing definitive evidence for psi. He does not mention the limitations of meta-analyses or the strong arguments and increasing consensus that retrospective or post hoc meta-analyses as used in parapsychology cannot resolve controversial issues.

For example, he claims the nonsignificant meta-analysis results by Milton and Wiseman occurred because they "botched their statistical analysis of the ganzfeld experiments" (p. 99). According to Carter, the statistical mistakes included not doing an analysis of direct hits that pooled all the experiments and using a cutoff time that excluded a certain study.

However, these controversial decisions are examples of the large number of decisions that must be made in a post hoc meta-analysis, and they show why post hoc meta-analyses are intrinsically unconvincing for controversial topics. The many methodological decisions for post hoc meta-analyses have no clearly right or wrong answer, and different decisions produce different results. For example, the analysis of pooled direct hits is not a standard meta-analysis technique, but it can be applied in some parapsychological meta-analyses and has sometimes been reported as a secondary analysis. Carter's opinion that it is the correct analysis appears to be largely based on the fact that it happens to give an outcome that he prefers in this case.

The large number of methodological decisions for meta-analyses, like other types of post hoc analyses, provides great opportunity for researchers to consciously or unconsciously bias the results. The endless debates about different possible statistical tests, inclusion cutoff criteria, data trimming, data transformations, and so forth, have no convincing resolutions. My experience working in medical research for the past two decades has been that researchers increasingly recognize that meta-analyses cannot be used to resolve controversial issues (Kennedy, 2006). Different conclusions from the same set of data have been reported in medicine as well as parapsychology (Kennedy, 2004).

For controversial topics, the most convincing experimental research comes from well-designed prospective studies. This is a well-established principle in medical research. Like other proponents of psi, Carter notes the large studies of aspirin and cardiovascular disease as an example of small effect sizes that are useful (p. 103). However, this misses the main point of these studies. The main point is that the effects were evaluated with large prospective studies rather than relying on post hoc meta-analyses of smaller studies as occurs in parapsychology.

Most meta-analyses in parapsychology with 30 or more studies with good methodology and a variety of experimenters have found that about 20 to 33 percent of the studies obtained statistically significant results. Parapsychologists have not been able to reliably obtain the higher replication rates of 80 percent or more that are expected for properly designed, convincing experiments.

Attempts to properly design convincing prospective experiments quickly reveal a profound methodological dilemma for parapsychology. The majority of meta-analyses in parapsychology have found that experiments with larger sample sizes do not have larger z scores (Kennedy, 2004, 2006). This is most clear for meta-analyses of RNG experiments, which is the largest experimental database in parapsychology. Contrary to the basic assumptions for statistical research, large studies have not produced more significant results. This finding indicates that the standard methods for power analyses

and experimental design are not applicable. This property also undermines the assumptions for standard statistical methods for hypothesis testing and meta-analyses. Following other proponents of experimental parapsychology, Carter ignores the profound implications of this property of the experimental results.

Given the low replication rates and apparent inability to reliably achieve good replication rates, a majority of objective scientists can be expected to find methodological problems to be the most likely explanation for the experimental results. Those who have had convincing personal paranormal experiences (which include this reviewer) may remain open to the possibility of some type of psi effect in the experimental research. However, typical scientists cannot be expected to find claims for psi based on this type of data to be convincing or meaningful.

Rupert Sheldrake's research with dogs anticipating their owner's return is another example of a controversial area that Carter presents in simple black and white terms. He considers the evidence to be compelling and criticisms to be erroneous or dishonest. Much of the research on this topic is observations without randomization or experimental design. Such observations have high potential for confounding by various types of habits, cues, and biases. The basic principle of experimental design is to use randomization to neutralize the potential biases. Sheldrake reports 12 trials with random selection of the time the owner returned, but, unfortunately, the randomization was not handled in a way that unambiguously neutralized the potential biases. The result is much debate and post hoc analyses addressing speculations about potential biases. Speaking for myself, I would have to spend many hours and possibly days thinking about all the potential biases in the experiments. A more effective study design would be to have the person return home either at a certain time (e.g., 4:30 p.m.) or later, with this binary decision made randomly after the person had left. The behavior of the dog would be recorded from about 4:00 to 4:25 p.m. to see if it predicted which days the person came home at 4:30. No other time periods would be analyzed.

Carter also has extensive discussion of the role of consciousness and observation in quantum physics. This topic is discussed in a chapter on philosophy and materialism and in another chapter on theories of psi. These chapters have many quotes and descriptions of philosophers commenting on science and scientists commenting on philosophy. One key point in these chapters is that the mysteries of quantum physics have room for paranormal phenomena. A related point concerns the hypothesis that observation by a dualistic consciousness causes collapse of the quantum wave function. This hypothesis has been suggested by certain physicists and not only is consistent with paranormal phenomena, but makes such phenomena probable.

Here too, the discussion of quantum physics focuses on writings by proponents of psi and does not consider the rapidly emerging findings in physics that are moving in a very different direction. One of the major current topics of research in quantum physics is decoherence, which is the primary obstacle for the development of quantum computers. Physical processes such as random collisions with air molecules, thermal radiation, and cosmic background radiation cause the *quantum-to-classical transition.* Conscious observation does not appear to be required. Among other findings, it is now known that this transition can occur partially and gradually rather than the sudden collapse of the wave function that was conceptualized earlier. If the earlier ideas about consciousness, observation, and collapse of the wave function were true, decoherence and quantum computers would have very different properties than are being found. Hypotheses about consciousness and paranormal effects do not easily emerge from this more recent research.

From a more practical perspective, the speculations about quantum physics and psi have not produced improved understanding of psi or more reliable psi effects. The 20 to 33 percent rate of successful replication appears to have been relatively constant over the past few decades. Speculations about quantum theories and other theories of psi have not noticeably altered that basic limitation.

Many of the negative comments Carter makes about certain skeptics are true. He describes the grossly biased attempt by CSICOP to analyze the Mars effect and to negate an obviously significant result that was contrary to their beliefs. The book also discusses Popper's philosophy of science and the critical role of falsification of hypotheses. The fact that some skeptics seem to have a fundamentalist approach to science is obvious. They appear to consider science as irrefutable fixed laws, much the same way that religious fundamentalists describe the inerrant authority of the Bible. Carter makes the point that the history of science clearly shows that scientific theories are best viewed as models that are useful in certain situations. The optimal scientific approach is to recognize that basic conceptual revisions can be expected.

The final chapter in the book discusses paradigms in science and resistance to paradigm shifts. That discussion focuses on dogmatic resistance to parapsychological findings.

However, the need for a paradigm shift may reside more with parapsychology. The fact that larger RNG studies typically do not provide more reliable results is an anomaly that must be confronted. Continuing to ignore the implications of this property of psi represents clinging to a state of Kuhn's "normal science"—rather than confronting the anomaly and possibly initiating a paradigm shift. If the basic assumptions for experimental parapsychology were true as claimed by Carter and

other proponents, I believe that high replication rates and practical applications of psi would have been achieved long ago. The methods for these results follow directly from the assumptions for the paradigm. It is time to recognize that the assumptions for the experimental paradigm in parapsychology have produced little scientific progress. Scientific progress is much more likely if researchers and science writers recognize the limitations of the findings and are open to possible paradigm shifts within the field.

References

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[Note added after publication: For those want to evaluate this review in context of the reviewer's personal beliefs about psi, see http://jeksite.org/psi/conclusions.pdf.]

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