JOURNAL OF SCIENTIFIC EXPLORATION
A Publication of the Society for Scientific Exploration

(ISSN 0892-3310)

Editorial Office: *Journal of Scientific Exploration*, Society for Scientific Exploration,
Kathleen E. Erickson, *JSE* Managing Editor, 151 Petaluma Blvd. So., #228, Petaluma, CA 94952 USA
EricksonEditorial@att.net, 1-415-435-1604, (*fax* 1-707-559-5030)

Manuscript Submission: Submit manuscripts online at http://journalofscientificexploration.org/index.php/jse/login

SUBSCRIPTIONS & PREVIOUS JOURNAL ISSUES: Order forms on pages 207–209 or scientificexploration.org.

Journal of Scientific Exploration (ISSN 0892-3310) is published quarterly in March, June, September, and December by the Society for Scientific Exploration, 151 Petaluma Blvd. So., #228, Petaluma, CA 94952 USA. Society Members receive online *Journal* subscriptions with their membership. Online Library subscriptions are $135.

JOURNAL OF SCIENTIFIC EXPLORATION
A Publication of the Society for Scientific Exploration

Volume 25, Number 1 2011

Editorial

Research Articles

Historical Perspective

Essay

Letters to the Editor

Book Reviews

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 1–6, 2011 0892-3310/11

EDITORIAL

As many JSE readers know, there was a considerable hubbub recently over a research paper scheduled to appear in the *Journal of Personality and Social Psychology*, written by Cornell University psychologist (and *JSE* Associate Editor) Daryl Bem. In that paper, Bem describes a series of nine experiments, involving more than 1,000 participants, apparently showing that subjects react physiologically to stimulus events whose random selection has yet to occur. Thus, the experiments seem to show (as Bem puts it) "the anomalous retroactive influence of some future event on an individual's current responses."

In my view, Bem's experiments are methodologically elegant and exceptionally clever. One reason this study is so notable is that Bem took several extensively analyzed psychological effects already vetted in the professional literature, and simply tested for them in a seemingly time-reversed direction, by collecting the subjects' responses prior to randomly choosing the corresponding stimulus events. Furthermore, four of the nine experiments replicate the experiments immediately preceding them in Bem's study.

Bem's report has attracted an extraordinary degree of national and international attention. He's been both excoriated and praised in prominent print media, blogged about endlessly, and interviewed on major television programs. Needless to say, this is an unusual degree of attention for academic parapsychological research, and presumably that's because (a) Bem is a prominent and widely respected member of his field, and (b) Bem's study is being published in a major mainstream journal, not a specialist parapsychological journal, or (I regret to say) the *JSE*.

Rather than echo the issues already discussed at length about Bem's report (e.g., his statistical methods of evaluation, the proper application or viability generally of Bayesian techniques, or the respects in which the often shrill and ill-informed criticisms of the study reflect stupidity, conceptual panic, dishonesty, or intellectual cowardice within the scientific establishment), I'd like to mention two issues which (as far as I've seen) have escaped general attention.

The first is that nearly all parties in the dispute seem to accept what for many would be the default interpretation of evidence suggesting precognition—namely, that (if the evidence is reliable and authentic) it indicates a form of backwards or counter-clockwise causation. I can't explore the relevant issues here in detail (for that, see Braude, 1997). But I can at least remind readers that what Jule Eisenbud used to call the "active analysis" of precognition often (and perhaps always) seems to be a live option. Let me indicate very briefly why that is.

According to the active analysis, we don't need to suppose that a future state of affairs is a causal condition of an earlier event (e.g., that tomorrow's plane crash caused someone at an earlier time to have a precognitive dream of the crash). One alternative is to describe the earlier (precognitive) event as a form of clockwise, psi-mediated inference. That is, we suppose it results from presumably unconscious—and possibly imagery-rich—future projections based on real-time psychic scanning. It would be a parapsychological analogue of an engineer dreaming about the collapse of a building under construction after examining that building's blueprints and current condition at the construction site. So in the case of the plane crash, the "precognizer" might simply use ESP to determine the *present* mental state of relevant passengers or crew (or the precarious physical state of the plane), and then unconsciously draw a reasonable inference that bubbles up to awareness in the form of a dream or hunch. Among other virtues, this analysis avoids the so-called *intervention paradox*, which seems to arise when we want to say that an *accurate* precognition of an event *E* allowed us to prevent *E* from occurring. On this interpretation, the precognition (or prediction) would not be represented semantically by the categorical future-tense statement, "Event *E* will occur no matter what." Rather, the assertion in question would be the conditional or hypothetical statement, "*E* will occur unless __," where the blank is filled in by a description of steps for preventing *E*.

Now this gambit won't work for cases like those described in Bem's study, where the ostensibly future cause is selected by random processes that are non-inferrable in principle. For those situations, the active analysis posits a different possibility—namely, that the future event was *brought about* through clockwise psychic influence—for example, psychokinesis or telepathic influence.

There's quite a bit more that needs to be said in order to make the active analysis seem like a genuinely viable option. For example, one familiar, but very flimsy, criticism of the analysis is that it's simply implausible to think that people would bring about (or want to bring about) the sorts of disastrous events that often seem to be precognized. Quite apart from the fact that ostensibly precognitive experiences of (say) plane crashes or mine collapses can be interpreted as psi-mediated inferences, Eisenbud replied convincingly to that argument, as follows:

> . . . there is no disaster, of whatever magnitude of degree or horror, that has ever been foreshadowed in dream, premonition, or Delphic utterance that cannot be matched in effect by one that has been brought about by some individual deliberately and with full awareness of the consequences. . . . The record on this score is so extensive and so clear—from fatal child abuse to Hiroshima, from capriciously started wars to shocking acts of political terrorism—that there can be no reasonable argument about human propensities in

> this domain. The only question is whether there is a hidden part of the average well-acculturated human being, who cannot consciously imagine himself battering a child or bombing a school building, that is subject to the same impulses that actuate persons who are openly destructive. (Eisenbud, 1982:175)

Another quite different and thorny set of issues concerns the concept of causality itself, along with the common assumption—expressed in various ways by philosophers of science and physicists—that retrocausation is no different from clockwise causation except for the temporal direction of the causal arrow. However, this *mirror image* view of retrocausation is actually exceptionally problematical. For one thing, the positing of causal connections is a form of explanation, and the activity of explaining is irreducibly pragmatic and appropriate only relative to a surrounding context of inquiry.[1] And for another, events are not items in a perspective-independent warehouse of ontological furniture. The pie of history may be sliced in an indefinitely large number of ways, none of which is inherently privileged. But that means that ordinary clockwise causal connections must be parsed, pragmatically, out of an intrinsically undifferentiated web of happening running in the same temporal direction. That is, each causal connection is merely and necessarily a part of a more temporally extended clockwise causal story. And there will always be an indefinitely large number of extended stories we could tell for a putatively identified cause and effect, each of which makes sense in its own way of how the former event leads causally to the latter, and none of which is appropriate *simpliciter*, or succeeds as an explanation no matter what.

However, retrocausalists treat ostensibly precognitive links as isolated from a presumed surrounding web of retrocausal happening—that is, as having no retrocausal antecedents stretching indefinitely into the future and no retrocausal consequences extending indefinitely into the past. For example, we're not told what events retrocausally led to the earlier plane crash, or what retrocausal consequences flowed backwards from the precognitive experience. In fact, the events described in allegedly retrocausal chains (e.g., plane crashes and dreaming) are even *described* using clockwise causal terms. Plane crashes and dreams are sequences of events running from earlier to later.

The second point is that the concept of causation, like every other concept, can't be isolated from an extensive network of additional related concepts—in this case, the concepts of explanation, understanding, intention, decision, action, to mention just a few. So we can't radically revise the concept of causation to allow causal links to be isolated from a surrounding history without making far-reaching and arguably gratuitous changes to members of the enormous conceptual network of which it's a part.

So retrocausalists appear to be caught on the horns of a dilemma, neither of which seems attractive or feasible. On the one hand they could try to do

what no one has come even close to doing so far—namely, explain what kind of retrocausal history in fact surrounds ostensibly isolated retrocausal links. (I explore, in Braude, 1997, reasons for thinking this is a dead end). On the other hand, retrocausalists could abandon the mirror image view and defend the position that retrocausal links differ radically from clockwise causal chains. That is, they could argue that retrocausal links can indeed be isolated from a surrounding mass of happening, and that they are not necessarily pragmatically selected points within one or more members of an indefinitely large number of possible and larger retrocausal stories. But (as I noted above) since concepts are not isolable entities, the concept of causality can't, in fact, be amended or abandoned in that way without forcing deep revisions elsewhere in an extensive network of related and apparently otherwise acceptable concepts. Therefore, retrocausalists would have to justify the need for a large-scale conceptual revision when the data can be explained without it, and when the alternative active analysis merely requires a much less sweeping change to our world view—namely, simply extending the stage of operations for forms of psychic functioning for which there is already a considerable body of evidence. Therefore, retrocausalists would need to defend what at best seems to be an unnecessary and unparsimonious position.

At any rate, I doubt that many of Bem's critics, who recoil at the suggestion of retrocausation, would be any happier with alternative interpretations of Bem's results that posit refined or extensive exercise of ESP or psychokinesis. And I know, in any case, that my position is definitely a minority opinion—although of course I believe that it has the virtue of being correct.

So let me turn to the other aspect of the reaction to Bem's paper that seems to have received too little attention.

In a nutshell, the problem is that the storm over Bem's paper was thoroughly predictable, and in my opinion it illustrates a point I've been harping on for many years—namely, that typical (even if solid and creative) quantitative laboratory experiments in parapsychology are doomed to be both unconvincing to the scientific community at large, and also conceptually unilluminating. The usual complaints (even from open-minded parapsychological fence-sitters) about the quantitative results are variations on the claim that, somehow or other, the math is wrong or at least suspect. Typically, critics charge that improper statistical measures were employed and that with more appropriate or sophisticated analyses, the alleged positive effects evaporate. Others, with no particular methodological axe to grind, simply have trouble shaking off the sneaking suspicion that the allegedly significant odds against chance point to a mistake somewhere. Parapsychologists even debate these points among themselves and frequently argue with one another over whether there's *any* convincing quantitative lab evidence for psychic functioning.

Moreover, meta-analyses certainly don't put an end to these disputes, because parapsychologists and non-parapsychologists alike debate whether the meta-analyses track the relevant features of the experiments. For example, when evaluating a collection of micro-PK tests, should a meta-analysis focus on individual random bits and assume (as some have) that the probability of a hit is the same per bit across all studies in the sample? Or should the meta-analysis focus also (or instead) on the number of bits generated per sample, the generation rate of bits, the duration of the experimental session, or the psychological conditions of the task? This is an especially tricky topic, because at bottom it's a version of the deeper and complex debate over what counts as an experimental *replication*. (For some thoughts on that issue, see Braude, 2002.) And that's just a specific instance of the even more fundamental philosophical debate over the nature of *similarity*.

In my view, what's always been needed are, first, psi effects so impressive that quantitative analyses are beside the point. These effects are plentiful enough, and include some ganzfeld and remote viewing hits that are so spot-on or so reliable that it's simply absurd to attribute the successes to chance. They also include PK results so dramatic and obtained under conditions so obviously clean that allegations of fraud are clearly and merely lame cries of protest (see Braude, 1997, Braude, 2007). And second, what's needed are gifted subjects who can produce results relatively consistently, with different experimenters and on numerous occasions. This helps diffuse the notorious "source of psi" problem, which arises acutely when conducting tests with unselected subjects. In those cases, there are so many unidentifiable and uncontrollable variables in the underlying causal nexus that it's never clear why the experimental results turned out as they did (see my Editorial in *JSE* 23:3, Fall 2009). These are cases for which ineffective quantitative analysis is the only way of defending the claim that something paranormal has occurred. But if you have a star subject who is regularly associated with conspicuously anomalous effects, we have at least a prima facie case for assigning that subject a key role in the causal nexus, and quantitative analysis quickly becomes irrelevant. For example, Joe McMoneagle's remote-viewing track record speaks for itself, irrespective of its statistical improbability, and no matter what other psychic influences might have partially contributed (positively or negatively) to the observed result.

I certainly don't pretend that this brief rant is the last word on the issues I'm discussing. As my considerably extended treatment elsewhere of all of them indicates, there's quite a bit more that can and needs to be said. I'm merely lobbying for expanding the dialogue over Bem's paper into important territory that so far seems to have been neglected.

* * *

One last note. I'd like to welcome two new members to the *JSE*'s team of Associate Editors. The first is Robert Bobrow, M.D., Clinical Associate Professor of Family Medicine at Stony Brook University, and author of the book *The Witch in the Waiting Room: A Physician Examines Paranormal Phenomena in Medicine*. The second is Jeremy Drake, Ph.D., a noted astrophysicist at the Harvard–Smithsonian Center for Astrophysics in Cambridge, Massachusetts. Among other activities, Jeremy is the principal investigator of the Center's recent research project showing that pulverized planetary dust may lie around double stars. I'm hoping that these illustrious additions to our team will help the *JSE* deal more expeditiously with the growing number of submissions to the *Journal*.

STEPHEN E. BRAUDE

Note

[1] Analogously, a request for directions can take many forms, and which form we choose—or which form succeeds—will depend on such things as who is asking for directions, what that person already knows, and what (under the circumstances) would be considered as too much detail or too little detail.

References

Braude, S. E. (1997). *The Limits of Influence: Psychokinesis and the Philosophy of Science, Revised Edition*. Lanham, MD: University Press of America.

Braude, S. E. (2002). *ESP and Psychokinesis: A Philosophical Examination (Revised Edition)*. Parkland, FL: Brown Walker Press.

Braude, S. E. (2007). *The Gold Leaf Lady and Other Parapsychological Investigations*. Chicago: University of Chicago Press.

Eisenbud, J. (1982). *Paranormal Foreknowledge: Problems and Perplexities.* New York: Human Sciences Press.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 7–28, 2011 0892-3310/11

RESEARCH

Are There Stable Mean Values, and Relationships between Them, in Statistical Parapsychology?

Wolfgang Helfrich

Fachbereich Physik, Freie Universität Berlin, Germany
helfrich@physik.fu-berlin.de

Submitted 12/03/09; Accepted 04/27/10

Abstract—Mean values of the z-scores of statistical psi effects in psychokinesis (PK) and extrasensory perception (ESP) are compiled. Under the influence of psi, the z-score distribution of experiments with binary random number generators (RNGs) at large numbers N of bits is known to be shifted and widened, but to remain indifferent to N. The mean z-score of binary one-trial experiments with dream psi is noted to be not much smaller than the mean z-score of these (presumably) mostly isolated many-trial experiments with RNGs. This could suggest that with two equivalent choices PK and ESP are equally effective, or very nearly so, and the mean z-scores are almost equal at all N down to N = 1. The widening is found to be attributable to a Gaussian distribution of the magnitude of the PK effect that causes the shift, provided the z-score distribution remains Gaussian. Formulas are proposed to compute from the values of shift and widening as observed with RNGs those of psi effects with more than two equivalent choices, such as falling dice. They are only partially confirmed by the (still rather scanty) datasets of such systems. Finally, psi-induced switching and mind-neuron interaction are revisited.

Keywords: statistical parapsychology—mean values—relationships between mean values—psi effects—psychokinesis (PK)—extrasensory perception (ESP)—random number generators (RNGs)

Introduction

Parapsychological effects are notoriously unreliable. In statistical studies of psychokinesis (PK), extrasensory perception (ESP), and mixed psi effects the influence on a single random event is necessarily insignificant, being in the range of statistical scatter. The statistical proof of a psi effect requires large numbers of individual trials, such as bits, falling dice, or guesses. In some cases, an overall chance probability of a psi effect is calculated directly from the data of all existing trials. In other cases, it is preferable or even necessary to begin with analyzing sequences of trials measured on various occasions. A

whole sequence is often referred to as an experiment. The number of trials in a sequence may vary from twenty up into the millions. In a meta-analysis, the chance probabilities of the sequences are suitably combined to obtain another overall chance probability. The values of the total chance probability may differ, depending on the method of calculation, but they tend to become smaller and smaller as the number of individual trials or sequences of trials increases. Accordingly, the psi effect becomes more and more credible. Baffling failures and irregularities have occurred in such studies and seem to be typical of psi, but they do not invalidate the overall statistical proofs of existence.

While there are several psi effects whose reality appears to be beyond reasonable doubt, it is not so clear whether some of their properties such as the hit rate in one-trial experiments or the z-score (to be defined immediately) of many-trial experiments have reliable averages. Also, it is not known whether these averages, like quantities in statistical thermodynamics, are related by laws or at least obey rules. Mean values of some psi effects have already been reported, often with fairly small errors. Although their stability in future studies is uncertain, it seems worthwhile to compile them and to look for mathematical relationships between them. This is the purpose of the present article. It is a delicate endeavor because it would probably be a mistake to regard psi effects as a new branch of physics. Psi seems to depend largely on psychological factors, among them talent and mood of the test person or subject, and many other hardly tangible conditions. A brief description of statistical evaluation techniques and an overview of established, statistically evaluated psi effects serve as background and precede the search for relationships.

Outline of Statistical Methods

In the following survey, the statistical studies of psi effects are arranged in groups according to the type of data analysis. In all cases the original aim was to determine either the excess hit rate above its mean chance expectation (MCE) value or the so-called effect size e, i.e. the mean value of the z-score per trial or single random event. These two quantities, which are closely related to each other, are often thought to be constants characterizing a given psi effect. The z-score may be defined as the ratio of the deviation of the number of hits from its MCE value to the root-mean-square (r.m.s.) deviation of the number of hits from MCE. Other designations for the r.m.s. deviation are standard deviation and square root of the variance.With a fixed actual hit rate h, the z-score takes the form

$$z = (h - p)N/[p(1 - p)N]^{1/2} \qquad (1)$$

Here N is the number of trials executed, either in all studies of a psi effect or in

the experiment considered, depending on the type of evaluation, h is the actual hit rate, and p is the MCE hit rate, i.e. the probability of a hit in the absence of psi. The effect size e or z-score per trial is defined by the relationship

$$e = z/\sqrt{N}, \tag{2}$$

In combination, Equations (1) and (2) yield for the effect size as a function of h and p

$$e = (h - p)/[p(1 - p)]^{1/2}. \tag{3}$$

On the assumption that they are basically constant, the quantities $h - p$ and, thus, e can be computed directly for any large N from the experimental data. The computed values are expected to have their standard errors. The standard error presupposes MCE and is identical with the root-mean-square (r.m.s.) deviation divided by $\sqrt{N}$. The definition of z is such that its standard error is unity. Although the r.m.s. deviation of z in many-trial experiments has been found to increase under the influence of psi (see below), it is common practice to equate the standard error of the effect size with its MCE value which because of Equation (2) is $1/\sqrt{N}$. Because of Equation (3), the standard error of $h - p$ or h then becomes $[p(1 - p)]^{1/2}/\sqrt{N}$. (The formula for the empirical standard deviation, which refers to the empirical mean value, substitutes $1/\sqrt{(N - 1)}$ for $1/\sqrt{N}$. The difference can be ignored at large enough N.) If the effect size differs among many-trial experiments, an overall mean value is obtained by weighted averaging. Evidently, if the effect size is much smaller than 1, a large number of trials is required to make the standard error smaller than the value to be determined.

If it turns out that $h - p$ and e are not constant but depend on N, one may have to give up the hypothesis of constant effect size. In fact, the mean z-score rather than the effect size appears to be independent of N in a certain class of many-trial PK experiments with binary random number generators. A meta-analysis of a multitude of experimental results has been performed in this case. It makes use of the psi-induced shift and widening of the Gaussian z-score distribution that have been observed in these experiments. The mean z-score of an experiment as represented by the shift can be used to calculate an overall z-score. Details of the meta-analysis, especially possible implications for effect size and hit rate, will be discussed below.

The chance probability of a particular psi effect is, as a rule, derived from its overall z-score. The chance probability P(z) of finding a z-score at or above the argument z is a well-known and tabulated function. In general, a z-score is regarded as significant when $z \geq 1.96$ with $P(1.96) = 2.5\%$. Sometimes, the limit of significance is set at $z = 1.645$ with $P(1.645) = 5\%$.

Experimental Background

Psi Effects Studied in One-Trial Experiments

Let me refer to a book by Radin (2006) for graphic examples of cumulative averaging of the hit rate of some psi effects. A cumulative (or up-to-date) average hit rate covers all studies up to the time when it is calculated. (The attribute "average" will occasionally be omitted, because the hit rate is an average by definition.) In his Figure 6-1, Radin plots the cumulative mean hit rate of dream psi experiments over the year of averaging. He takes most of the data from a review by Sherwood and Roe (2003) dealing with 47 studies. In the dream psi tests, which began in 1966, the subject intends to dream of the contents of a picture selected at random from a given pool of ten. In the early studies, the picture was "sent" by another person during dream (or REM) sleep phases of the subject who was woken up after dreaming to record their impressions. Later on, in a simplified mode, the pictures were displayed in an empty room on a computer monitor while the subject slept, and the subject recorded their dreams from memory in the morning. The next day the pictures in the pool were ranked according to the estimated probability of being the correct one. A hit was registered when the sent picture was in the first half of the ranking. There seems to be no significant difference in the results between the two modes. The final cumulative mean, or overall, hit rate of all 1,270 trials was 59.1%, where 50% is expected by chance. The fluctuations of the early values of the cumulative average hit rate are large (varying between 52% and 65%), which is a consequence of the small numbers of trials involved. When the initial fluctuations had ceased, the cumulative average hit rate fluctuated within the range of $(59.1 \pm 1)\%$, and there was no apparent drift.

In his Figure 6-6, Radin (2006) gives a similar graph for ganzfeld psi tests. Here a waking subject in the ganzfeld state is to "receive" a picture or the essence of a video clip. The object is randomly selected from a pool of four and "sent" by another person or only displayed on a computer monitor. After 88 ganzfeld studies with altogether 3,145 trials, performed from 1974 through 2004, the overall hit rate was 32%, while 25% was expected by chance. In addition to the strong initial fluctuations, the cumulative mean hit rate displays, except for the last ten years, a small downward drift starting from 35%. The time taken by a ganzfeld trial seems to have been one or two hours.

Finally, based on studies by Sheldrake (2003), Radin (2004), and others, Radin (2006) in his Figure 6-10 plots cumulative mean hit rates of experiments on the sense of being stared at. Here the subject is to guess after a signal whether or not he or she is being stared at by another person. In 60 different studies, with altogether 33,357 trials, the overall hit rate was 54.5% where chance expectation was 50%. Apart from the typically strong early fluctuations, there

is a slow fluctuation of the cumulative average in the range of 54.5 ± 0.5%. The interval between trials with staring periods of usually 10s seems to have been on the order of minutes.

Using the direct method, Radin (2006) calculated the overall chance probability P for the datasets of each of the three psi effects. The probability was derived from the final cumulative, or overall z-score, which is obtained from the total number of trials and the overall hit rate by means of Equation (1). The overall z-scores were $z_{overall} = 6.49$, 9.07, and 16.44 for the dream psi experiments, the ganzfeld studies, and the tests of the sense of being stared at. Though not quoted by Radin, they are explicitly written down here because they will be needed in the following for a comparison of effect sizes. The chance probabilities P(z) associated with $z_{overall}$ are $P \approx 10^{-10}$, 10^{-19}, and 10^{-59}, respectively. The standard errors of the cumulative mean excess hit rates $h - p$ shown in Radin's plots, i.e. the r.m.s. deviations of the excess numbers of hits divided by $\sqrt{N}$, are on the order of 10%.

In all three types of studies, the psi effect per trial as expressed by the extra hit rate $h - p$ in excess of its MCE value seems rather stable after a sufficient number of trials. This is surprising because different laboratories and many different test persons took part in the experiments. There is of course no guarantee that the cumulative mean values will remain unchanged when new experiments are conducted in the future. For instance, admitting only subjects of proven talent or modifying some experimental details may in the long run have dramatic consequences.

Psi Effects Studied in Many-Trial Experiments of Fixed Length

A psi experiment with an MCE hit rate $p = 0.2$ is card guessing with ESP cards. These come in decks of 25 cards bearing one of the five symbols: circle, square, cross, star, or wavy lines. Since their invention in 1934, a large number of trials have been accumulated, ranging up to a million and more as a function of the experimental quality demanded for inclusion. Steinkamp (2005) recently gave a survey of reviews of the numerous studies, beginning with an attempt to determine the effect size per trial, e, as defined by Equation (2). Most probably, evaluations of e were based on 25 consecutive trials or multiples thereof. The overall result varied with experimental quality and other factors, ranging roughly from $e = 0.05$ to 0.02. Steinkamp also dealt with the dependence of the psi effect on psychological and physical conditions. It seems impossible in the case of ESP cards to define a more accurate mean value of the effect size.

Another psi effect with an MCE hit rate of 20% is studied in the ball drawing test. It was introduced and investigated by Ertel (2005) whose report was reviewed and supplemented with some unpublished data by Broderick (2007). In 231 experiments, one of 50 table tennis balls marked with 1, 2, 3, 4,

or 5 in equal proportion was drawn from an opaque bag with the subject aiming for one of the five numbers. After recording the number and returning the ball, the bag was shaken to restore random mixing. The number of balls drawn in an experiment was either 240 or 360. The experiments were done in the years 1998 to 2002, with a different test person in all 231 cases. The total number of trials, draws in this study, was 71,760, while that of hits was 15,646, which is 9.0% above the mean chance expectation of 14,352. This corresponds to a hit rate h = 0.218 instead of its MCE value p = 0.2. From these numbers and Equation (1), the overall z-score was calculated to be $z_{overall} = 12.07$, which leads to $P \approx 10^{-32}$. Insertion of h and p into Equation (3) yields the overall effect size e = 0.045. A remarkable feature of Ertel's experiments is a conspicuously high frequency of near misses, e.g., 2 and 4 when 3 was the targeted and most often drawn number.

For a comparison of psi effects, it will be useful to know $\langle z_{sequ} \rangle$, i.e. the mean value of the z-scores, of the 231 sequences of trials in the ball drawing studies. From the overall z-score or the annual values of z, one computes $\langle z_{sequ} \rangle = 0.79$ or 0.80, respectively. In both cases, Stouffer's formula

$$z_{Stouffer} = \langle z_{sequ} \rangle \, \Omega^{1/2}, \tag{4}$$

is used inversely to compute $\langle z_{sequ} \rangle$ from $z_{Stouffer}$. The quantity substituting here for $z_{Stouffer}$ is the overall z-score or its annual value, respectively, while Ω is the number of experiments involved. Actually, $z_{Stouffer}$ as defined by Equation (4) is the mean overall z-score, if every z_{sequ} obeys the same Gaussian distribution regardless of N. This fact may help one to understand Equation (2) defining the z-score per trial. In the present computation, as in others, $z_{Stouffer}$ is replaced by or interpreted as $z_{overall}$ with hardly any loss in accuracy whenever z_{sequ} satisfies the condition just mentioned and Ω is very large.

Psi Effects Studied in Many-Trial Experiments of Variable Length

The PK studies of mind–matter interaction using binary random number generators (RNGs) or the fall of dice involve more than a billion bits (Radin & Nelson, 1989, 2000) and more than 2.5 million fallen dice (Radin & Ferrari, 1991). The experiments began in 1935 and 1959, respectively, after the invention of suitable machines. The abundance of trials is due to automatization which permitted the number N of bits or throws in an experiment to be varied over many orders of magnitude. The subjects intended to produce either a positive or a negative deviation of the number of hits from its MCE value. Again, the stated goal of these studies and their meta-analyses was to determine the effect size e, i.e. the PK effect per bit or fallen die. This quantity was thought not to depend on the number of trials in an experiment and thus to characterize the psi effect.

Interestingly, among numerous graphs the authors diplayed the distributions of psi-influenced z-scores. The number N of bits or fallen dice does not enter into these representations. Any MCE statistical distribution of hits is essentially Gaussian, if the hit rate is not too near either of its limits, zero, or unity, and if N is large enough. This was the case in all the experiments underlying the meta-analyses. In plotting the graphs, negative intentions (i.e. those aiming for fewer than the normal number of hits) were reinterpreted as positive intentions by changing the sign of the associated z-scores. The resulting plots were approximated by modified Gaussian distributions that were shifted in the direction of positive z. In addition, they were widened in comparison with the normal distribution, although this was not intended in any way. Radin and Nelson (2000) and Radin and Ferrari (1991) computed the overall z-score of the modified distribution from the z-scores of the experiments by means of Stouffer's formula. From this z-score, they calculated the overall chance probability of the dataset. A more complete treatment takes into account both the shift and the widening factor of the Gaussian distribution under the influence of psi (Helfrich, 2007). It results in a much smaller value of the overall chance probability. The treatment will be revisited below in the search for a relationship between shift and widening.

It is remarkable that Gaussian z-score distributions could be used, at least as plausible approximations, to describe the effect of psi, even though N varied by several orders of magnitude among the experiments. Their apparent indifference to N raises the suspicion that the z-scores of PK experiments with RNGs and falling dice are independent of the number N of trials in a sequence, or, in other words, that psi modifies the distribution of chance probabilities in the same way for all (large enough) N. This would clearly justify equating $z_{Stouffer}$ to $z_{overall}$ if Ω is large. The conjecture that $\langle z_{sequ} \rangle$ does not depend on the number N of random events in a PK experiment had been put forward earlier, mainly under two headings: the Intuitive Data Sorting model (IDS) of May, Radin, Hubbard, Humphrey, and Utts (1985) and the Decision Augmentation Theory (DAT) of May, Utts, and Spottiswoode (1995). These models explain PK in terms of precognition, which in the case of RNGs seems possible if the test person pushing the button enters a continuous predetermined random sequence of bits at an appropriate moment. The model runs into difficulties in the case of dice, where no sequence is entered, and is in conflict with systematic RNG studies of the PEAR (Princeton Engineering Anomalies Research) group (see below). Moreover, a random choice of bits brought about by quantum events such as nuclear decay, tunneling in diodes, or thermal scattering is incompatible with the idea of predetermination. Let me take a neutral position and simply assume that psi effects are goal-oriented and probably reach their goal on rather direct pathways which remain to be explored.

Binary RNGs. The original meta-analysis by Radin and Nelson (1989) was based on the z-scores of 597 experiments with binary RNGs. The authors defined as an experiment the largest possible aggregation of bits collected in a given report under a single directional intention. Pilot and confirmatory tests were treated as separate experiments. They did not distinguish between pure cases and others, probably rare, in which the intentions were intermingled. Also, the number of subjects following one another and the number of button pushes in an experiment were disregarded. (In this context, it is interesting to note that Radin and Nelson (1989) expressed results reported merely to be insignificant by the MCE z-score distribution but cut off at the limits $z = \pm 1.645$.) The mean shift $\langle z_{sequ} \rangle$ and the widening factor or standard deviation α as read from the plotted psi-modified Gaussian z-score distributions are $\langle z_{sequ} \rangle = 0.6$ and $\alpha = 1.5$. Analytically, the authors derived $\langle z_{sequ} \rangle = 0.645$ and $\alpha = 1.601$ from the data points underlying the modified distribution. The effect size was averaged over the experiments with a weight proportional to N and found to be about $(3 \pm 0.5) \times 10^{-4}$, with surprisingly little dependence on experimental quality and other factors. Even deleting 17% of the experiments as outliers, to achieve homogeneity of the e-values computed from the individual z-scores, did not make a marked difference. The Princeton Engineering Anomalies Research (PEAR) group, who processed more bits than any other psi laboratory, found the effect size to be on the order of $e = 1 \times 10^{-4}$ (Jahn, Dunne, Nelson, Dobyns, & Bradish, 1997, Jahn & Dunne, 2005).

In the updated meta-analysis of Radin and Nelson (2000), the 258 experiments of the PEAR group were collapsed into a single data point (or two), while new ones, 84 reported by 1987 and 92 reported after 1987, were added. For this dataset, the practical absence of a correlation between N and z of the RNG experiments was expressly stated. (The correlation of $\sqrt{N}$ and z was given as $r = -0.015$, $P = 0.36$, which is far below the level of statistical significance.) It can also be directly recognized from a graph in Schub's (2006) critique of Radin and Nelson (1989, 2000) that displays data points in a (z,logN) scatter diagram. Also in the update, the overall z-score was computed with Stouffer's method. The result, $z = 16.1$, corresponds to the chance probability $P(16.1) \approx 10^{-58}$. Particularly valuable for a comparison with other psi effects is a plot of the cumulative mean z-score per experiment as a function of the year of publication. Its final value for the period of 1959 to 1987 is $\langle z_{sequ} \rangle = 0.71 \pm 0.05$ at the top of a slight upward fluctuation following a bottom at 0.62. The post-1987 data are plotted separately, their overall mean value being $\langle z_{sequ} \rangle = 0.61 \pm 0.12$. Their standard error is large because of the relatively small number (92) of experiments. Since the RNG mean z-score is a reference point in the following, some additional details should be noted. Dividing the data of 380 selected RNG experiments into quartiles of 90 according to bit number N,

Bösch, Steinkamp, and Boller (2006) found $\langle z_{sequ} \rangle$ to range from 1.05 (smallest N, z probably inflated by some gifted test persons) to 0.41 (largest N, but $N > 10^9$ omitted). Their overall mean was $\langle z_{sequ} \rangle = 0.67$. The value used for RNGs in the estimates below is $\langle z_{sequ} \rangle = 0.65$. The slight dependence of $\langle z_{sequ} \rangle$ on N would seem to be not in serious conflict with Radin and Nelson's (2000) finding that $\langle z_{sequ} \rangle$ is practically constant. The question of a general constancy of $\langle z \rangle$ that holds either for sequences or, in other situations, for single trials, will be an important topic in the following. The plot of cumulative mean z-scores can be regarded as a valid counterpart to the plots of cumulative hit rates of the first three psi effects since $h - p$ is easily converted into e, i.e. the mean z-score of a one-trial experiment.

It was pointed out above that an indifference of the z-score distribution to N implies, for the result of a single PK experiment, an N-independent distribution of chance probabilities. Let it be emphasized again that this is in sharp conflict with the more common assumption that the effect size or, equivalently, the psi-induced part of the hit rate, is independent of N. In the latter case the mean psi-induced z-score is expected to increase with $\sqrt{N}$, because the average difference of psi-affected and MCE hit numbers varies with N, while the standard error of the hit numbers is proportional to $\sqrt{N}$. The PEAR group adhered in general to the concept of a constant PK effect per bit. Dobyns and Nelson (1998) utilized the wealth of data at PEAR to compare this concept to the model of constant $\langle z_{sequ} \rangle$. In this comparison, a sequence generally consisted of the bits between button pushes, the bit number varying from 200 to 200,000. Another experimental variable was the number of bits in a 0.2s block (which at PEAR was called a trial). Apart from the regular 200-bit blocks, there were blocks of 20 and 2,000 bits. It turned out that the data agree better with a constant effect size than with a constant $\langle z \rangle$ per sequence of bits.

Recently, it was proposed that there may be room for both models, that of constant e as well as that of constant $\langle z_{sequ} \rangle$ (Helfrich, 2007). The constant-$\langle z_{sequ} \rangle$ model apparently applies to isolated experiments, i.e. those which in motivation, time, and probably other factors are well separated from others of the same kind. A constant effect per bit, independent of N, appears to prevail whenever a particular experiment is serial or, more aptly, "embedded" in a series of similar experiments, which seems to have been the typical situation at PEAR. The 515 experiments underlying the updated meta-analysis of Radin and Nelson (2000) were, of course, not distinguished with respect to the degree of isolation. Confidence that they were sufficiently isolated can be based only on the Gaussian z-score distribution and the small number of experiments in most of the 216 original publications.

The conflict between the two models is confusing, and there is a general tendency to fall back on the concept of an N-independent effect per bit because

this hypothesis appears more physical. Acceptance of an N-independent z-score may be made easier by a recent observation of Jahn and Dobyns (2007). They pointed out that a $\langle z_{sequ} \rangle$ can be independent of N not only if the effect size equals $e(N) = \langle z_{sequ} \rangle / \sqrt{N}$ for all bits in a sequence of N bits, but also if it equals $e(n) = \frac{1}{2}\langle z_{sequ} \rangle / \sqrt{n}$ at any N, with n being the running number of bits. The equivalence is a consequence of the identity

$$(1/2N) \int_0^N (1/n^{1/2}) dn \quad = \quad 1/\sqrt{N} \tag{5}$$

Utilizing previous PEAR data, the authors tried to find out which of the two variants of the constant-$\langle z_{sequ} \rangle$ model is the better one, without reaching a conclusion. No such check has as yet been made exclusively for isolated experiments.

Also at PEAR, Ibison (1998) and later on Dobyns, Dunne, Jahn, and Nelson (2004) examined the constancy of the effect size in a dramatic fashion. In otherwise unchanged experiments, they increased the bit rate from the regular 200 per block to 10,000 times as many. A block of random bits was generated, in the usual manner, within an interval of 0.2s in every period of 0.9s. Low speed, i.e. the usual bit rate, was obtained by taking only one of every 10,000 bits. Both studies involved many test persons. In Ibison's study, 70 series of 1,000 blocks were recorded with each intention (high, low, baseline). For a given intention, high-speed and low-speed sequences alternated at random from block to block but were sorted afterward according to speed, thus representing two experiments in the evaluation. The focus was on the difference effect, i.e. the difference of the z-scores with positive and negative intention divided by $\sqrt{2}$. At low speed, the overall difference z-score was 1.2967. This is insignificant, but happens to agree very well with what may be expected on the basis of Radin and Nelson's meta-analysis (1989) and rather well with the large body of experiments by PEAR that employed 200-bit blocks. In fact, inserting $N = 7\times10^6$ into Equation (2), one obtains from the overall difference z-score divided by $\sqrt{2}$ the effect size $e = 3.5\times10^{-4}$. However, this inference is of little weight and, in particular, does not prove that the experiments were of the "embedded" type, because of the insignificance and, correspondingly, large standard error of the z-score. At high speed, the difference z-score was −3.7391, which is significant ($P = 1\times10^{-4}$), but larger than the low-speed result only by a factor near three while a factor of 100 may be expected on the basis of Equation (1). In other words, the effect size as computed from the overall z-score decreased by a factor of roughly 30. Even more surprisingly, the sign of the overall z-score at high speed was contrary to intention. Apart from essentially confirming Ibison's

results in a total of 149 similar experiments, Dobyns et al. did 39 experiments solely at high speed, noting no significant difference in effect size from the high-speed part of the experiments mixing the speeds. The findings of Ibison (1998) and Dobyns et al. (2004) agree with neither the constant-$\langle z_{sequ} \rangle$ nor the constant-e model. However, they suggest that the PK effect per bit tends to be suppressed when otherwise the absolute value of the z-score would become "too large". One may wonder whether the two studies, if taken as two times three single experiments, could be of the isolated type. In this case mean difference z-scores on the order of $z = 1$ would be within the expected range, but mean difference z-scores on the order of $z = 4$, as found at high speed, are outside. The change in the sign of z cannot be explained by any existing model. These studies suffer from large errors because, like many specific studies, they involve relatively small numbers of experiments.

Falling dice. Radin and Ferrari's meta-analysis of the PK effect on falling dice was based on 148 experiments. They obtained for the effect size $e = 0.012 \pm 0.006$ the large uncertainty arising from a considerable dependence on experimental quality and other factors. The mean shift and the widening factor as read from the drawn Gaussian distribution of psi-affected z-scores of dice experiments are $\langle z_{sequ} \rangle = 1.5$ and $\alpha = 2.5$. The overall z-score was computed to be $z_{Stouffer} = 18.2$, resulting in a chance probability of 10^{-74}. There is no plot of the cumulative mean z-score per experiment over time and no check of the correlation between z and N in the meta-analysis of the dice experiments.

The PK effect on falling dice has not only been investigated less often and mostly prior to the advent of RNGs, it is also more prone to pitfalls than that on RNGs. Perhaps the greatest problem is the fact that even without PK the hit rates of the six faces of a die usually are not identical. For instance, some material is lost if the numbers are marked by small scoops, which favors the six-face to end up on top. Radin and Ferrari (1991) showed in their Figure 6 that the effect of the asymmetry is nearly as large as the PK effect. To avoid mechanical effects, one has to admit only balanced experiments in which all six faces are equally often the target of intention. This reduces the number of experiments underlying the meta-analysis from 148 to 69. With this restricted dataset, Radin and Ferrari computed $z_{Stouffer} = 7.617$, which correponds to a chance probability of 10^{-14}. Reverse use of Stouffer's formula (4) led from this number to the average z-score $\langle z_{sequ} \rangle = 0.917$ (± 0.1) of the 69 experiments. The situation may be even more complicated because Figure 6 of Radin and Ferrari (1991) also seems to show that certain die faces, in particular 6, 2, and 1, are preferred in PK studies even after correcting for the effect of mechanical asymmetry.

There is another serious problem with the dice data because, as a rule, several dice are thrown at once, the upper limit apparently being 96 (Radin, 2006). Both Radin and much earlier Rhine (1972) provide data suggesting that

the PK effect per die is independent of the number of dice in a throw. Let me adopt this independence as an assumption, although it seems unlikely to hold for extremely large numbers of dice. Otherwise, a single throw of a sufficient number of dice could generate a mean z-score of any value desired.

Tentative Conclusions Drawn from Comparing Mean Values of Psi Effects

The most important data of the psi studies considered here are compiled in Table 1 for convenient comparison. Inspection of the data suggests examination of three types of possible relationships between mean values of psi effects. First, the mean z-scores of the one-trial ESP experiments are not much smaller than the mean z-score of many-trial PK experiments on RNGs. How close is this similarity at best and what could it mean? Second, the widening factor α of the shifted and widened z-score distributions which ideally is identical to its standard deviation may be regarded as a mean value. Can a simple explanation be put forward for the widening? Is there a relationship between α and $\langle z_{sequ} \rangle$, i.e. widening and shift, that holds for binary RNGs, falling dice, and, perhaps, other PK or ESP effects? Third, the mean shift of the z-scores found with binary RNGs is smaller than those found with falling dice and ball drawing. These experiments differ by the number of targets that are equivalent in the absence of psi or, for short, by their multiplicity m. Can a plausible formula be proposed that relates the mean z-score at any m to its particularly trustworthy value at m = 2? To find such a relationship was the goal of a preliminary publication (Helfrich, 2008). It may be difficult to achieve, even when more data become available, if indeed psi effects with m > 2 discriminate between choices that without psi are equivalent. Finally, an update complementing an earlier article (Helfrich, 2007) is given of psi-induced switching and its possible role in mind–neuron interaction.

A Comparison of One-Trial Experiments in ESP to Many-Trial Experiments in PK

A glance at Table 1 reveals that the mean z-scores per trial, i.e. $\langle z_{trial} \rangle = z_{overall}/\sqrt{N}$, of the studies of dream psi, ganzfeld psi, and the sense of being stared at, are less than an order of magnitude below the mean z-score $\langle z_{sequ} \rangle$ of (presumably) isolated RNG experiments usually consisting of a large number of trials. As already mentioned, the number of trials, N, has different meanings in the two cases. In the first three studies it is the total number collected in the course of years, while in the fourth study N refers to a single experiment. The extreme effect sizes of the one-trial experiments may be due to a high degree of isolation of the trials. The dream psi experiments seem to be particularly well isolated from each other since no more than one picture was “sent” in a night. The increase of the hit rate from 50% to 59.1% represents the maximum effect

TABLE 1
Compilation of Data on PK and ESP Experiments

Type of Experiment	Dream	Ganzfeld	Staring	Ball Test	ESP Cards	Bits	Dice, All	Dice, Balanced
Trials	1270	3145	33357	71760	$>2\cdot10^6$	$>1.4\cdot10^9$	$>2\cdot10^6$	?
Sequences	na	na	na	231	na	515	148	69
Hit rates (in percent)	59.1/50	32/25	54.5/50	21.8/20	nc /20	nc	nc	nc
$z_{overall}$	6.49	9.07	16.44	12.07	nc	nc	nc	nc
$\langle z_{trial}\rangle = e$ isolated	0.182	0.162	0.090	na	na	na	na	na
$\langle z_{trial}\rangle = e$ embedded	na	na	na	0.045 in sequ	0.02–0.05	$3\cdot10^{-4}\pm 5\cdot10^{-5}$	0.0122 ± 0.0062	0.00861 ± 0.00110
$\langle z_{sequ}\rangle$	na	na	na	0.79	na	0.65, (0.41–1.05)	1.5	0.917
$z_{Stouffer}$	na	na	na	na	na	16.1	18.2	7.617
Widening factor α	na	na	na	?	?	1.5	2.5	?
Reference	Radin (2006)	Radin (2006)	Radin (2006)	Ertel (2005)	Steinkamp (2005)	Radin & Nelson (1989, 2000)	Radin & Ferrari (1991)	Radin & Ferrari (1991)

na, not applicable. nc, not calculated. Trials means number of individual random events. Sequences means number of (presumably) isolated sequences. Hit rates are overall psi-influenced values (above) and MCE values (below). (See also main text.)
$z_{overall}$ is the z-score taken over all one-trial experiments for a given psi effect.
$\langle z_{trial}\rangle = e$ is the effect size or effect per trial, which equals $z_{overall}/\sqrt{}$(total number of trials) in the case of isolated trials, but is an average of $z_{sequ}/\sqrt{}$(number of trials in a sequence), in the case of embedded many-trial experiments.
$\langle z_{sequ}\rangle$ refers to (presumably) isolated many-trial experiments only. The values of $\langle z_{sequ}\rangle$ in parentheses are taken from Bösch, Steinkamp, & Boller (2006).
$z_{Stouffer}$ represents $\langle z_{sequ}\rangle \times \sqrt{}$ (number of presumably isolated sequences).

size in Table 1. The ganzfeld experiments with an increase from 25% to 32% are almost equally impressive, but more difficult to compare as they are of type m = 4. Here the time taken for sending and receiving a single picture, including preparations, seems to have been an hour or two. Experiments testing the sense of being stared at, which permit repetition probably in a matter of minutes, resulted in another high hit rate, 54.5% instead of normally 50%, but the excess above 50% is only half as large as in the dream psi experiments.

There is still a gap by a factor of 3.6 between $\langle z_{sequ}\rangle = 0.65$ as found in psi experiments with binary RNGs and $\langle z_{trial}\rangle = 0.182$ as found in dream psi studies. The number of equivalent choices is m = 2 in both cases, but one effect

is ascribed to PK and the other to ESP. Let me try to reduce the gap further with the following argument based on Equation (5). Replacing the integral in this equation by the sum of the discrete values of $1/n^{-1/2}$ over all n and keeping only the first term (n = 1) in an attempt to realistically describe the case N = 1, leads to ½ instead of 1 on the left-hand side of this equation, while 1 is obtained on the unaffected right-hand side. This suggests $e_{N=1} = ½\langle z_{sequ}\rangle$, so that $\langle z_{trial}\rangle$ of the dream psi studies would be expected to be half as large as $\langle z_{sequ}\rangle$ of RNG psi experiments at large bit numbers ($N \geq 20$) where the difference between integral and sum is negligible. The gap thus shrinks to the factor 1.8, and the two mean z-scores of dream psi, one actual and the other "theoretically" predicted, may be regarded as "practically equal", considering the uncertainties and fluctuations mentioned elsewhere in the present article. Of course, this idea is speculative in more than one respect. For instance, replacing for N = 1 the integral in Equation (5) by the first term of a sum seems crude, but it might be at least a step toward a more accurate treatment. Unlike the mean z-score of sequences, that of one-trial experiments is limited by the maximum effect size which is e = 1 in the case m = 2 (see below). The closeness of $\langle z_{trial}\rangle = 0.182$ to that limit might be a further factor explaining its small value. In the tests of the sense of being stared at, another binary choice, $\langle z_{trial}\rangle$ is half as large as in dream psi. This could be due to the much higher frequency of the guesses which possibly impairs their isolation. A mean z-score proportional to the square root of the time spent for achieving it has been proposed by Nelson (2006) in his theory of a time-normalized yield in psi experiments.

If the considerations of the last two paragraphs are correct, three types of mean z-scores may have to be distinguished in psi experiments. The first is that of a single trial isolated from all other one-trial and many-trial experiments of the same kind. The second is the mean z-score of a rapid sequence of (many) trials which is isolated from all similar experiments including single trials. The third is that of a trial, either single or part of a sequence, embedded in an environment of similar experiments.

The fact that after the correction $\langle z_{trial}\rangle$ of dream psi experiments and $\langle z_{sequ}\rangle$ of RNG experiments, both of multiplicity m = 2 appear to be equal or nearly so suggests two tentative conclusions: First, psi is (almost) equally effective in PK and ESP, and, second, the mean z-score of an isolated experiment depends little on the number of trials involved all the way down to N = 1. The conclusions are interdependent, i.e. both of them are either right or wrong. The mean z-score for m = 2 seems to lie in the vicinity of 0.5 in one go or, in psychological terms, upon one impulse of motivation. This is when there is no interference with "nearby" similar experiments which appears to reduce the psi effect. Conversely, one may wonder if several impulses can act in long sequences, especially those performed by a series of subjects, thus augmenting the z-score.

Looking for a Relationship between Psi-Induced Shift and Widening of the MCE-Gaussian Distribution

Let it first be shown that the widened Gaussian distribution can be understood as the product of two Gaussian distributions. The normalized versions are being used whose integrals are unity. One of them is the MCE distribution without PK influence,

$$(2\pi)^{-1/2}\exp(-z^2/2). \tag{6}$$

(For convenience, the subcript of z_{sequ} is dropped here and in some of the following formulas.) The other is due to a newly introduced scatter of the PK effect per bit or falling die,

$$(2\pi)^{-1/2}\, s_{PK}{}^{-1}\, \exp[-(\zeta^2/2s_{PK}{}^2)], \tag{7}$$

where s_{PK} is the standard deviation of the PK effect which, like ζ, is measured in units of z. (The mean shift of z can be ignored in these considerations.) Integrating the normalized product function $(4\pi s_{PK})^{-1}\, \exp[-(z + \zeta)^2/2 - \zeta^2/(2s_{PK}{}^2)]$ over ζ for a given z leads to a widened Gaussian distribution as a function of z

$$[2\pi(1 + s_{PK}{}^2)]^{-1/2} \exp[-z^2/2(1 + s_{PK}{}^2)]. \tag{8}$$

It follows from the final form that the widening factor α of the Gaussian distribution modified by psi obeys the relationship

$$\alpha^2 = 1 + s_{PK}{}^2. \tag{9}$$

Therefore, the widening can be interpreted as the consequence of a Gaussian scattering of the PK effect. To avoid averaging back to the mean effect size (zero in the present example), the fluctuations of the effect size must be slow as compared to the duration of an experiment. For binary RNGs, a different model was proposed by Pallikari (2004, 2008) who attributes the widening to a tendency of equal bits to agglutinate in the presence of psi. However, at least in the PEAR data no such effect was noted (Nelson, 2008).

Inspecting the z-score distributions of the PK effects on binary RNGs and dice immediately shows that the increase in width, $\alpha - 1$, roughly equals the mean shift $\langle z_{sequ} \rangle$ in both cases. As a proportionality of these two quantities seems mathematically unsound, it is preferable to use the equally simple equation

$$s_{PK} = \gamma \mid \langle z_{sequ} \rangle \mid , \tag{10}$$

assumed to hold for RNGs and dice and, it is hoped, any number of equivalent choices. This "geometrical" model gives $\gamma = 1.72$ when the values for binary RNGs, $\langle z_{sequ} \rangle = 0.65$ and $\alpha = 1.5$, are inserted into Equations (9) and (10) and s_{PK} is eliminated between these equations. If proportionality applies, the same value of γ should be obtained with dice. Inserting $\alpha = 2.5$ and $\langle z_{sequ} \rangle = 1.5$, the value found in the meta-analysis of all 148 dice experiments, results in $\gamma = 1.53$. Using instead the mean z-score of the 69 balanced experiments, $\langle z_{sequ} \rangle = 0.917$, yields $\gamma = 2.50$. Both values of γ for dice differ from that for RNGs, one being smaller and the other larger, but with $\langle z_{sequ} \rangle = 1.5$ agreement is clearly better than with $\langle z_{sequ} \rangle = 0.917$.

An alternative model may start from the formula for the mean chance probability of a single experiment, i.e. for the factor φ by which the overall value of P_2, another kind of chance probability, is reduced on average by an additional experiment under the influence of psi (Helfrich, 2007). Taking account of the fact that the number of possible z-scores per standard deviation is proportional to α, one has for the shifted and widened distribution the reduction factor

$$\varphi = \alpha \times \exp[-(\langle z^2 \rangle - 1)/2] , \tag{11}$$

while the total chance probability for the result of Ω experiments is $P_2 = \varphi^{\Omega}$. Use of $\langle z^2 \rangle = \alpha^2 + \langle z \rangle^2$, which follows from integrating over z the product of z^2 and the normalized Gaussian distribution function of Equation (6), transforms Equation (11) into

$$\varphi = \exp[\ln\alpha - (\alpha^2 - 1 + \langle z \rangle^2)/2] \tag{12}$$

Incidentally, the exponent of the exponential function can be interpreted as minus the free energy which it costs to move a single particle from the MCE to the modified Gaussian distribution. As in the exponent of a Boltzmann factor, the energy is understood to be divided by (or given in units of) kT, where k is Boltzmann's constant and T absolute temperature. The potential is entropic, reflecting the number of ways in which a particular z-score can be attained. Accordingly, the internal energy of the hypothetical one-particle ideal gas is purely kinetic. It can be ignored, being conserved under shift and widening.

The digression into physics is not needed to realize that the exponent in Equation (12) may be split into the terms $\ln\alpha - (\alpha^2 - 1)/2$ and $-\langle z \rangle^2/2$. This allows separating the contributions of shift and widening to the reduction factor φ of the modified Gaussian distribution. For RNGs with $\alpha = 1.5$ and $\langle z \rangle = 0.65$ the terms are -0.22 and -0.21, respectively. Therefore, in the case of RNGs the reduction factor due to widening practically equals the reduction factor due to shift, although widening was not intended in the experiments. A model relating

mean shift and widening may now be based on the expectation that this equality applies as well to PK effects of other multiplicities. For falling dice with α = 2.5 and $\langle z \rangle$ = 1.5 (or 0.917) the two terms in the exponent of Equation (12) are −1.71 and −1.125 (or −0.42), respectively. Evidently, for both values of $\langle z \rangle$ the "free energy" of widening is distinctly larger than that of shifting. The discrepancy is smaller with $\langle z \rangle$ = 1.5 than with $\langle z \rangle$ = 0.917. On the whole, it seems that the geometrical model is the more attractive one and that the larger mean shift is the "better" result, despite the fact that it includes unbalanced studies. However, the dice data are not sufficient in number and quality to rely on them. As yet, it is not possible to decide which of the two models proposed is the correct one or if both of them fail.

The detailed data of Ertel's (2005) experiments, as yet unpublished, should reveal whether widening also occurs in the ball drawing test. Interestingly, the Global Consciousness Project initiated by Nelson et al. (1996) uses the widening of the z-score distributions in a network of binary RNGs to monitor events that arouse worldwide emotion.

Looking for a Dependence of the Mean z-Score on the Number of Equivalent Choices

The question of a possible dependence of $\langle z \rangle$ on the multiplicity m will be discussed largely in terms of many-trial experiments, but the results can always be transferred to one-trial experiments by putting N = 1. The simplest and most extensively studied psi effect is the electronic version of coin throwing carried out with binary RNGs. Also, psi effects of m = 2 seem to be immune to the psychological perturbations which apparently plague psi effects of higher multiplicities. Therefore, they are a suitable reference point in dealing with psi effects of m > 2. The foremost question is whether the mean z-score per isolated one- or many-trial experiment varies with the number m of choices that are equivalent without psi. To begin with, let me propose two different mathematically straightforward models. The first one is based on the trivial assumption that $\langle z \rangle$ is independent of m. If the problem of widening is left aside, the model means in physical terms that the free energy of shifting the Gaussian distribution of z-scores is the same for all m. This "constant-$\langle z \rangle$" model seems to fail when applied to the fall of dice with m = 6 and the ball test with m = 5. In both cases, the mean z-scores per experiment are larger than those of binary RNGs. However, the difference is small for m = 5 where $\langle z_{sequ} \rangle$ is 0.79 instead of 0.65. A direct confirmation of the constant-$\langle z \rangle$ model in the case of one-trial experiments could be the near equality of the effect sizes in the dream and ganzfeld psi studies where m = 2 and 4, respectively.

The second model may be called the "generalized binary model." It is based on the idea that the MCE frequency of misses is reduced by a psi-induced

partial conversion of a miss into a hit. The efficiency of conversion is assumed to be equal for all misses and not to depend on multiplicity. This is an extension of the binary model to every pair of a miss and the target. Accordingly, the number of hits in excess of its MCE value is taken to be e(1 – p)N, so that the mean z-score may be written as

$$\langle z\rangle = e(1-p)N/[p(1-p)N]^{1/2} \tag{13}$$

If a probable small difference between the mean z-scores for single-trial and many-trial experiments is disregarded or comparison is restricted to one type of experiments, the mean z-scores depend solely on the multiplicity m = 1/p of the experiments. This will now be indicated by the subscript m. Substituting in Equation (13) $\langle z\rangle_2$ for $e\sqrt{N}$ and cancelling $\sqrt{N}$ leads to

$$\langle z\rangle_m = \langle z\rangle_2 (1-p)/[p(1-p)]^{1/2} \tag{14}$$

Note that the denominator in Equation (14) tends toward zero with decreasing p. Straightforward manipulations transform this into the simple form

$$\langle z\rangle_m = (m-1)^{1/2}\langle z\rangle_2. \tag{15}$$

This relationship was recently proposed (Helfrich, 2008) to explain the large difference of the shift of the z-score distribution of falling dice from that of binary RNGs. Incidentally, the generalized binary effect bears a similarity to the above-mentioned indifference of the PK effect per die on the number of dice in a throw.

The ratio of the shifts $\langle z\rangle_6/\langle z\rangle_2 = \sqrt{5} = 2.34$ predicted by Equation (15) is indeed close to the experimental value 1.5/0.65 = 2.31 obtained with the mean shift of the dice experiments if all of them are included. Equation (15) fails when only the balanced dice experiments are considered, which reduces the ratio of the shifts to 0.917/0.65 = 1.41. It also fails when applied to Ertel's (2005) ball drawing test, as it predicts $\langle z\rangle_5/\langle z\rangle_2 = 2$, while the experimental value is $\langle z\rangle_5/\langle z\rangle_2 = 0.79/0.65 = 1.22$. The latter could, perhaps, be raised markedly if the psi-induced near misses reported by Ertel can be counted among the hits. A questionable feature of Equation (15) is the predicted divergence of $\langle z\rangle_m$ with m, suggesting a method to achieve high levels of significance in a single psi experiment.

It is tempting to speculate that the two simple formulas just introduced might be useful as the lower limit (the constant-$\langle z\rangle$ model) and the upper limit (the generalized binary model) for $\langle z_{sequ}\rangle$ or $\langle z_{trial}\rangle$ in a psi experiment of multiplicity m > 2. If the constant-entropy model is regarded as the basic one,

"proximity" or "similarity" or other psychological effects could increase $\langle z \rangle_m$ up to the limit prescribed by the generalized binary model. Both the near misses in Ertel's ball drawing tests and a preference for certain die faces in the fall of dice are possible examples. In one case it seems to be numerical proximity, in the other it might be a subconscious predilection for certain numbers. Such effects could result, whenever $m > 2$, in a deformation of the distribution of hits which depends on the specifics of the experiment.

Switching Properties of PK for Multiplicity m = 2

How the mind may act on the neuron via the neuron's synapses has been discussed elsewhere (Helfrich, 2007). The general problem of psi-induced switching in the case $m = 2$ may be worth being treated again, mainly to include one-trial experiments and the effect of widening. The limiting hit rates of statistical psi effects are unity and zero, i.e. a hit every time or no hit at all. Because of Equation (3) and $m = 1/p$, the associated effect sizes are $e = \sqrt{(m - 1)}$ and $e = -1/\sqrt{(m - 1)}$, which for $m = 2$ take the values $e = 1$ and $e = -1$, respectively. If the hit rate is 50% in the absence of psi and 60% in its presence, as in dream psi experiments, the surplus rate of hits over misses is 20% of the normal hit rate, but 50% of the psi-reduced rate of misses. This is a substantial effect and not too many single-trial experiments are needed to achieve statistical significance. Of particular interest seems to be the case of many-trial experiments at large enough N where a Gaussian distribution of z-scores exists and is shifted by PK. Let me assume that a critical z-score separating on- and off-states is located at $z = 1.96$, so that without psi the chance probability for $z \geq 1.96$ is $P(1.96) = 2.5\%$, a typical value for the limit of significance. The state $z \geq 1.96$ is regarded as the on-state, while lower z-scores belong to the off-state. In the presence of psi with a non-fluctuating $z_{psi} = 0.65$, the chance probability for $z \geq 1.96$ becomes $P(1.96 - 0.65) = P(1.31) = 9.5\%$. If widening is taken into account, the argument of P in the last equation has to be divided by the widening factor $\alpha = 1.5$, which leads to $P(0.87) = 19.1\%$. These ideas may now be applied to mind–neuron interaction. Here the z-score represents an electric potential divided by its standard deviation from its MCE value. The critical value of z is taken to represent the threshold potential which, when it is exceeded, causes the neuron to fire a new action potential into its axon. The circa 10,000 synapses of the neuron are assumed to act like 50:50 probabilistic switches when an action potential arrives through one of the presynaptic axons. Together, they thus mimic a binary RNG emitting, instead of bits, either a small amount of electric charge or no charge. A complete theory has to include the dynamics of the neuron potential, replaced here by potentials that are static during each switching period (of a few ms). Taking into account the dynamics probably lowers the quality of switching, while the fluctuations of the z-score

might improve it. An increase of the probability of firing an action potential from 2.5% to 19.1% may appear too small for sufficiently reliable switching. Several switching processes in series or in parallel may be required for a useful effect. On the other hand, probability differences near 100% seem unreasonable. After all, one has to expect that psi allows influence but no control, at least in everyday situations. In particular, while persons may be able to communicate to some extent by means of psi, they should not be able to enslave each other in this way. Similar anthropic arguments with regard to $\langle z_{sequ} \rangle$ were put forward in the previous article.

Concluding Remarks

The search for relationships between mean values yielded three intriguing findings. First, the mean z-score at m = 2, i.e.with two equivalent choices, is nearly indifferent to the number of trials in isolated experiments down to N = 1. Second, it is equal or nearly so in PK and ESP. Third, the widening of the z-score distributions of many-trial experiments can be explained in terms of a Gaussian scattering of the effect size. The three relationships require, of course, further examination before they can be considered proved. In particular, the Gaussian shape assumed for the psi-modified z-score distributions of PK experiments with RNGs and dice is so far only an approximation to rather rough experimental distributions. Two models were proposed that might give the widening factor as a function of the shift at any m if the relationship is known for m = 2. One of them may be correct, but cannot yet be definitively checked because of problems with the data on falling dice and unavailability of the data in the case of ball drawing. Moreover, two attempts to relate the mean z-score at arbitrary m to that at m = 2 seem to fail. It was argued that this may be due to a discrimination, under the influence of psi, between targets of equal MCE hit rate.

A basic equality of the mean z-scores at m = 2 in isolated PK and ESP experiments, and only a weak dependence of them on the number of trials in an experiment, would be in accordance with an often-noted far-reaching indifference of psi experiments to distances in space and time and, in the case of PK, to the type of binary RNG. The order of magnitude of the mean z-scores, which seems to emerge in such experiments, appears compatible with a possible role of psi in mind–neuron interaction and extrasensory communication. The conjecture that these two phenomena (of enormous philosophical and practical implications) do exist may be no more than fantasy, but it is supported by experimental results in statistical parapsychology.

Acknowledgments

I am particularly grateful for support to the following three persons. Eberhard Bauer generously supplied copies of articles and pointed out important recent literature. He

and Walter von Lucadou gave me the opportunity to present the contents of this article at the October 2009 meeting of the Wissenschaftliche Gesellschaft für Parapsychologie in Offenburg, Germany. Roger Nelson encouraged me to write this article, read a preliminary version of the manuscript, and made some cautionary comments (which I did not always heed).

References

Bösch, H., Steinkamp, F., & Boller, E. (2006). In the eye of the beholder: Reply to Wilson and Standish (2006) and Radin, Nelson, Dobyns, and Houtkooper (2006). *Psychological Bulletin, 132,* 533–537.

Broderick, D. (2007). *Outside the Gates of Science.* New York: Thunder's Mouth Press.

Dobyns, Y. H., Dunne, B. J., Jahn, R. G., & Nelson, R. D. (2004). The MegaREG Experiment: Replication and interpretation. *Journal of Scientific Exploration, 18,* 369–397.

Dobyns, Y. H., & Nelson, R. D. (1998). Empirical evidence against decision augmentation theory. *Journal of Scientific Exploration, 12,* 231–258.

Ertel, S. (2005). The ball drawing test: Psi from untrodden ground. In: M. A. Thalbourne, & L. Storm (Eds.), *Parapsychology in the Twenty-First Century* (pp. 90–123). Jefferson, NC: McFarland & Company.

Helfrich, W. (2007). Is the psychokinetic effect as found with random number generators suitable to account for mind–brain interaction? *Journal of Scientific Exploration, 21,* 689–705.

Helfrich, W. (2008). Is there a relationship between the psychokinetic effects on the fall of dice and on random number generators? *Proceedings of The Parapsychological Association 51st Annual Convention & The Society for Psychical Research 32nd Annual Convention* (pp. 344–347).

Ibison, M. (1998). Evidence that anomalous statistical influence depends on the details of the random process. *Journal of Scientific Exploration, 12,* 407–423.

Jahn, R. G., & Dobyns, Y. H. (2007). Dependence of anomalous REG performance on run length. *Journal of Scientific Eploration, 21,* 449–472.

Jahn, R. G., & Dunne, B. J. (2005). The PEAR proposition. *Journal of Scientific Exploration, 19,* 195–245.

Jahn, R. G., Dunne, B. J., Nelson, R. D., Dobyns, Y. H., & Bradish, G. J. (1997). Correlations of random binary sequences with pre-stated operator intention: A review of a 12-year program. *Journal of Scientific Exploration, 11,* 345–367.

May, E. C., Radin, D. I., Hubbard, G. S., Humphrey, G. S., & Utts, J. M. (1985). Psi experiments with random number generators: An informational model. *Proceedings of The Parapsychological Association 28th Annual Convention*, vol. 1, 237–266.

May, E. C., Utts, J. M., & Spottiswoode, S. J. P. (1995). Decision augmentation theory: Towards a model of anomalous mental phenomena. *Journal of Parapsychology, 59,* 195–220.

Nelson, R. D. (2006). Time-normalized yield: A natural unit for effect size in anomalies experiments, *Journal of Scientific Exploration, 20,* 177–199.

Nelson, R. D. (2008). Personal communication.

Nelson, R. D., Bradish, G. J., Dobyns, Y. N., Dunne, B. J., & Jahn, R. G. (1996). FieldREG anomalies in group situations. *Journal of Scientific Exploration, 10,* 111–142.

Pallikari, F. (2004). On the false hypothesis of psi-mediated shift of statistical average in tests with random event generators. *Proceedings of The Parapsychological Association 51st Annual Convention*, pp. 157–171.

Pallikari, F. (2008). In search of the universal character of micro-psychokinesis. *Proceedings of The Society for Psychical Research 32nd Annual Convention*, pp. 382–383.

Radin, D. I. (2004). On the sense of being stared at: An analysis and pilot replication. *Journal of the Society for Psychical Research, 68,* 246–253.

Radin, D. I. (2006). *Entangled Minds*. New York: Paraview Pocket Books.

Radin, D. I., & Ferrari, D. C. (1991). Effects of consciousness on the fall of dice: A meta-analysis. *Journal of Scientific Exploration, 5,* 61–83.

Radin, D. I., & Nelson, R. D. (1989). Evidence for consciousness-related anomalies in random physical systems. *Foundations of Physics, 19,* 1499–1514.

Radin, D. I., & Nelson, R. D. (2000). *Meta-Analysis of Mind–Matter Interaction Experiments: 1959–2000.* Saratoga, CA: Boundary Institute. [Also in: (2003) Research on mind–matter interaction: Individual intention. In: W. B. Jones, & C. C. Crawford (Eds.), *Healing, Intention and Energy Medicine: Science, Research Methods and Clinical Implications* (pp. 39–48), Edinburgh, UK: Churchill Livingstone/Elsevier.]

Rhine, L. E. (1972). *Mind over Matter*. New York: Collier Books.

Schub, M. H. (2006). A critique of the parapsychological random number generator meta-analyses of Radin and Nelson. *Journal of Scientific Exploration, 20,* 402–419.

Sheldrake, R. (2003). *The Sense of Being Stared At*. New York: Crown Publishers.

Sherwood, S. J., & Roe, C. A. (2003). A review of dream ESP studies conducted since the Maimonides dream ESP studies. In J. Alcock, J. Burns, & A. Freeman (Eds.), *Psi Wars: Getting to Grips with the Paranormal*, Thoverton, UK: Imprint Academic.

Steinkamp, F. (2005). Forced-choice ESP experiments: Their past and their future. In: M. A. Thalbourne, & L. Storm (Eds.), *Parapsychology in the Twenty-First Century* (pp. 124–163), Jefferson, NC: McFarland & Company.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 29–46, 2011 0892-3310/11

RESEARCH

Exploring the Relationship between Tibetan Meditation Attainment and Precognition

Serena M. Roney-Dougal

Psi Research Centre, 14 Selwood Rd., Glastonbury, Somerset BA6 8HN, Britain
serena@psi-researchcentre.co.uk

Jerry Solfvin

University of Massachusetts Dartmouth, USA

An earlier version of this paper was presented at the 32nd Convention of the Parapsychological Association, Winchester, Britain, 2008.

With grateful acknowledgment to Bial Foundation Bursary no:64/04 and to Perrott-Warrick Fund for financial assistance with this research.

Submitted 2/16/10; Accepted 10/08/10

Abstract—This study of advanced practitioners of meditation extends our earlier work testing the hypothesis that meditation enhances psychic awareness or "psi" (Roney-Dougal, Solfvin, & Fox, 2008). Ten (male) Tibetan Buddhist monks participated individually in eight sessions, each comprising a meditation period and a computerized test of precognition in which they were asked to rate each of four pictures on a 100-point scale in terms of how likely it was to be randomly selected as the "target" to be displayed at the end of the session. The normalized rating assigned to the target itself was defined as the "psi" score, where a score of zero is chance expectation. Overall, psi scores did not exceed chance expectation, $t(79) = 0.70$, $p = 0.49$, 2-tailed, $r = .08$, and the type of meditation (mantra or visualization) did not make a difference. The correlation between years of meditation practice and psi scores was in the predicted direction but not significantly different from zero (rho = 0.28, $p = 0.22$). Nevertheless, the two most experienced meditators, both Nyingma lamas, achieved significant mean psi scores, $t(15) = 2.25$, $p = 0.04$, 2-tailed, $r = 0.50$, confirming a similar finding from our earlier work.

Keywords: precognition—meditation—Tibetan Buddhist monks

Introduction

Research into the effect of meditation with practitioners of many years suggests that meditation may affect consciousness in some way that gives more reliable conscious psychic awareness (psi) (Roney-Dougal & Solfvin, 2006, Roney-Dougal, Solfvin, & Fox, 2008). There has, however, been no research on what it is about meditation that is psi-conducive. This study is a preliminary foray into that area, working with (male) Tibetan Buddhist monks.

Tibetans use many different types of meditation. There are, however, two basic types: shamatta, which is where the meditator focuses in one-pointed concentration on an object of some sort, such as the breath; and vipassana, otherwise known as insight meditation, where you let your mind contemplate a specific topic. Most early research into meditation and its effect on psychic awareness (see Roney-Dougal & Solfvin, 2006, for a survey of psi research with meditation practitioners) has used shamatta-type techniques, such as Transcendental Meditation (TM) and other yogic meditation techniques. More recent research (e.g., Bierman, 2007) has used vipassana practitioners.

The Yogic and Buddhist teachings state that it is the shamatta techniques that result in psi once you have attained Samadhi (the state of total awareness beyond thought), the Yogis calling the resulting psi *siddhis* and the Buddhist teachings calling it *clairvoyances*. There is a further requirement among Tibetan Buddhists of attainment in "vipassana on emptiness" (special insight), and overcoming the obstacles of the desire realm, after the attainment of Samadhi (Khangser & Khensur Rinpoches, 2006). Both teachings are very clear in stating that the aim of meditation is enlightenment, that psychic abilities manifest as part of the increase in subtle awareness, and that this needs to be recognized and dealt with appropriately.

However, these shamatta techniques are very varied, so it was decided that, while we had the opportunity of working with more advanced practitioners, we would ascertain if there was a differential effect dependent on the type of meditation: mantra or visualisation. Mantra is used by all Tibetans whether lay person or monastic, and is the practice of chanting, either mentally or out loud, a specific phrase while keeping count on a special bead necklace (mala), similar to the Christian rosary. Mantra meditation is called a "ngondro," which is a technique that is a required preliminary for Tibetans prior to practicing other meditation techniques. Mantra is also used in the yogic traditions where it is called japa yoga, and again is considered to be a preliminary method. This technique was popularized in the West in the 1970s by the Maharishi who set up schools in TM, a personalized mantra meditation. In contrast, visualization meditation techniques are used more extensively within the Tantric traditions of both Yogis and Tibetan Buddhists, and tend to be used by more advanced meditators. In visualization meditation, one visualizes a specific object, for example the Buddha, and aims to hold this visualization for a certain period of time. Some Tibetan Tantric visualization practices can be extremely complex.

Participants who consider themselves to be clairvoyant state that they rely on visualization to a certain extent (White, 1964). In general, altered states such as dreaming and the psychological technique of the "Ganzfeld," which supposedly facilitate visualization, have been found to be psi-conducive techniques (Ullman, Krippner, & Vaughan, 1973, Radin, 1997).

There is a Tibetan tradition of chanting mantras while undertaking a clairvoyant task, as witnessed with one of the Dharamsala oracles, Youdrun-Ma (Roney-Dougal, 2006). Tibetans also chant mantras when doing "Mo divination" (a Tibetan divination practice), as witnessed on two occasions with different practitioners, Geshe Topgyal-la and Drakser Rinpoche (Roney-Dougal, 2006). We therefore ran this series of sessions as purely exploratory with no specific hypothesis regarding the efficacy of either technique.

One of the problems encountered in our previous studies was how to accurately assess meditation attainment. Up to now we have used a meditation attainment questionnaire (MAQ), but there are intrinsic problems with self-report. So it was decided to see if the Stroop test could provide an objective measure of shamatta meditation attainment. The "Stroop effect" (Stroop, 1935) is the delay in responding correctly to the color the word is written in, when the word itself is a different color (incongruent word). The Stroop effect is highly correlated with attention and is often used to measure fatigue or distractibility of one's attention. It was hypothesized that more meditation experience would lead to a greater ability to hold one's attentional focus, as measured by a decrease in reaction times to the incongruent words, and an increase in accuracy of response. It was therefore included in this series as a measure of focus and concentration, a possibly objective measure of change in conscious awareness as a result of meditation, in line with research done by Mind–Life scientists with Tibetan Buddhist meditators (Field, 2008).

Hypotheses

1) Confirmatory

Meditation attainment will correlate significantly with performance on the psi task. The previous studies indicated that there are two suitable methods for assessing meditation attainment:

a) official status within the monastic hierarchy: comparison of the psi scores of the different groups according to their official status.
b) self-report on the MAQ, in particular correlation of the psi score with the number of years of meditation practice.

2) Exploratory

a) Mantra versus visualization instructional set will differentially affect psi scoring.
b) Other measures on the MAQ may show a relationship with psi scoring.
c) Years of meditation practice will correlate with reduced Stroop effect scores, and hence psi awareness will correlate with reduced Stroop effect scores.

Method

Design

A basic free-response precognition design was used in which all participants were required to complete eight sessions (trials): four mantra and four visualization. In each session, a precognition computer program (preCOG) chose a target set at random from a pool of 25 sets, which were pictures of Tibet and India, appropriate for Tibetan monks living in India. There were four pictures in each set. Target selection was a two-stage process: firstly a selection of the target set was made, such that the participant never received the same set more than once, then a random selection of the target from within the set. The participant aimed to choose the target correctly from the set.

PreCOG was used so that the sessions could be run without any assistants, enabling the author to work with the percipients at any time that was mutually convenient for them and under whatever conditions there might be. As the target was chosen by the computer, this precognition design has both a randomized double-blind design and in-built fraud control, so there is no need for specially designed rooms, multiple linked-up computers, or any of the other laboratory facilities. Therefore, it is ideal for research "in the field." It is also a suitable method to use with Tibetans who have a tradition of precognition (oracles and Mo divination) being used by both monks and lay people (they are therefore very open to the possibility of precognition). For further details of these practices, see Roney-Dougal, 2006.

With regard to the two different sorts of meditation technique being compared (mantra or visualization), for each participant the first four of the eight trials involved one of the meditation types, randomly determined, and the last four trials involved the other. The participants were given the printed instructions in Tibetan, to which the experimenter was blind, prior to the first and fifth sessions.

Participants completed the Stroop effect test immediately prior to each of the eight psi testing sessions. Participants completed a 10-trial practice run in the first session, followed by one 10-trial plus two 20-trial runs (beginner, intermediate, and advanced). Subsequent sessions dropped the practice run. This resulted in a total of 410 trials per participant. A control sample of ten student monks (who were not meditators and so did not participate in the psi sessions) also did the Stroop test eight times.

The MAQ was administered after completion of all eight sessions, together with an interview concerning the participant's experience.

Materials

The precognition computer programme (preCOG) was written by Jezz Fox for an Apple Macintosh MacBookPro with OsX. Custom written software, using RealBasic (www.realbasic.com), was developed for the presentation of the materials and recording of data. This guided the researcher and participant through the procedure, beginning with a data entry screen to enter trial and participant details. A configuration file allowed specifics of the design to be set including: 1) the number of trials each participant would take part in; and 2) the point in the procedure at which the target would be selected (before the trial period for a clairvoyance protocol, after the trial period for a precognition protocol, or randomly before and after). The after selection was used in this study.

For the judging/rating stage, preCOG displayed the four pictures initially simultaneously at half size, and then one at a time on the screen at their full size. When all four had been viewed, they were again displayed simultaneously on the screen at half size for rating on a scale of 1 to 100, with the restriction of each item having to be awarded a unique rating. Following the ratings the data were recorded to disk before providing feedback to the participant by displaying the target for the session. All the randomization was performed using pseudo-random algorithms. (A pseudorandom number generator (PRNG) is an algorithm for generating a sequence of numbers that approximates the properties of random numbers. The algorithm was tested for adequate randomness for the initial Indian research (Roney-Dougal & Solfvin, 2006).)

The participant's mentation was recorded throughout the session, which permits qualitative analysis as well as the more customary quantitative statistical analyses.

The MAQ was designed with help from David Luke. This questionnaire assessed the number of years the participants had practiced different disciplines, such as physical asanas (yoga practices), breathing techniques (pranayama), and meditation, including the different types of meditation practice the person had done. It also assessed the preliminary practices (ngondros), which all monks must complete prior to starting meditation practices and which are often done in a retreat situation. This enabled the amount and type of meditation practice to be clearly specified. Each participant estimated the number of hours per day or week that they practiced the various techniques, as well as specifying the number of years for which they had practiced them. In addition, they stated whether or not they were practicing regularly at the time of doing the research.

The Stroop test was designed for Tibetans by a team of University Massachusetts at Dartmouth, upper-level computer science students. In this

version, the names of the colors blue, green, red, and orange were printed in Tibetan characters. The participant read the word and was asked to respond by indicating on the computer keyboard the color in which the word was printed. Sometimes the color names were the same as the color in which the word was printed (congruent) and sometimes the color name was different (incongruent).

Participants

The study included any Tibetan monks who had done at least five years meditation practice, other than the one Rinpoche (a Rinpoche, also called tulku, is considered to be a reincarnation of a high lama and therefore to already be a high adept). There were a total of ten participants, who completed eight sessions each. These comprised two Nyingmapa Lamas (a Lama is a monk who has completed a three-year, three-month, and three-week retreat), one Gelugpa Rinpoche, and seven Gelugpa Geshes (a monk who has a degree, equivalent to a Ph.D., in Buddhist philosophy). Geshes do not normally start practicing meditation until completion of their studies, which sometimes includes an extra year in Tantric college. Only some Geshes practice meditation regularly. Most are more involved in teaching Buddhist philosophy or other work. Nyingma and Gelug are two sects within Tibetan Buddhism. They have different training in meditation.

Sampling was conducted by personal visits to two Tibetan Buddhist monastic universities in Bylakuppe, South India: Sera Jey, a Gelug monastic university with approximately 5,000 monks, and Namdroling, a Nyingma monastic university with approximately 3,000 monks. The director (in Sera Jey this was the monastic abbot, and in Namdroling His Holiness Penor Rinpoche, who was head of the Nyingma sect) had been contacted for the first study, the project described, permission formally requested, and assistance solicited in locating potential participants. A personal meeting with potential participants was arranged, normally by the translator, who was the English teacher at the Secondary school in Sera Jey and a student monk in Namdroling. The project was described in detail, and an invitation to participate was made. Any candidate who volunteered was included in the study.

As described in the previous study (Roney-Dougal, Solfvin, & Fox, 2008), the Tibetans were very reluctant to participate for a variety of reasons, and it was only in the second year of doing this research that we managed to get any participants, thanks to the great kindness of Khangser Rinpoche. By the time we reached this final study, time and finances were severely limited; it took six months to work with the ten participants.

Procedure

The procedure for each session was the same. The same time of day and location was used, wherever possible, for each session with a given participant. Participants did only one session per day. On arrival for the first session the participant was fully informed of the protocol and what was expected of them.

Initially the participant completed the Stroop test. When this was complete, they were set up for the main psi test and the experimenter and translator left the room. The procedure was recorded on the computer in English and on tape in Tibetan, which guided the participant through the session. This procedure was also written in Tibetan for the participant to refer to if needed. There was a 5-minute relaxation period, a statement of intent to become aware of the target picture, followed by a 15-minute meditation practice. At the end of this, there was a 4-minute awareness period in which they were instructed to allow their mind to go blank and allow any target-related experience to occur.

On completion of the awareness period, the participant made a drawing of their experience relating to the target. They then asked the experimenter and translator to return and described the experience to them. This was recorded on the computer. The participant then saw all four pictures starting with picture A, and rated them on a 1–100 point rating scale, according to the degree of confidence with which they considered the picture to be the target. Finally the computer showed the actual target picture. This self-judging method is in line with Tibetan practice.

After they had completed all eight sessions, they completed the MAQ and a short interview asking them about their previous experience of, and belief in, psychic abilities, as well as various aspects of the present study.

Results

Overall Results of Current Study

The dependent variable for this study was psi scoring on the free-response test, which was the participant's rating of the target picture for the session. This was normalized by a score, called TrDev, which is standardized relative to the mean and standard deviation of all the ratings assigned in the trial as follows:

$$\text{TrDev} = \frac{\text{Target rating} - \text{Mean of trial ratings}}{\text{SD of trial ratings}}$$

where:
Target rating: the rating (1–100) assigned to the target picture
Mean of trial ratings: average of all four ratings assigned to trial set pictures
SD of trial ratings: standard deviation of all four ratings assigned to trial set pictures

This variable was developed and used in the previous Tibetan study (Roney-Dougal, Solfvin & Fox, 2008), and is essentially a standard normalization procedure, akin to a z-score. This method of analyzing free-response ratings was first developed and used by Stanford and Sargent (1983). There are problems with all the methods used for analyzing free-response data. We decided to use this method because it is the most sensitive to the participant's clarity of choice of the target.

1) Confirmatory Hypothesis—Relationship of Meditation with Psi

a) Comparison of Psi Scores in Relation to Monastic Hierarchy

Overall, the psi scores were at chance expectation ($t(79) = 0.70$, $p = 0.49$, 2-tailed, effect size $r = 0.08$). In previous studies it was found that monastic hierarchy related to a difference in psi scoring as per Tibetan tradition. This result is once again apparent in this study. The mean psi scores for the participants according to their official status, Lamas, Rinpoche, and Geshes, are shown in Figure 1.

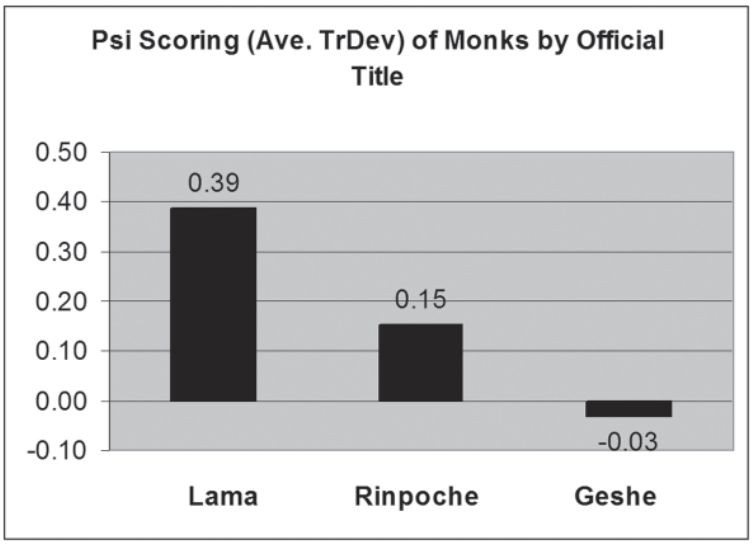


Figure 1. Psi scoring according to monastic rank.

The hypothesis that meditation attainment as measured by monastic rank is related to increasing psi scoring was tested out with monastic rank (Geshe, Lama, Rinpoche) × session (8) mixed ANOVA with repeated measures (Bruning

& Kintz, 1987, section 2.7). The average psi scores for the Lama, Rinpoche, and Geshe groups were 0.39 (SD = 0.69), 0.15 (SD = 0.88), and −0.03 (SD = 0.93), respectively. The results showed no significant main effect for monastic rank ($F(2,7) = 0.07$, $p = 0.93$) or session × rank interaction ($F(14,49) = 0.77$, $p = 0.77$). However, the psi scores for the two Lamas in this study were significantly greater than chance expectation ($t(15) = 2.25$, $p = 0.04$, 2-tailed, effect size $r = 0.50$). While this was not specifically hypothesized for this study and hence is a post-hoc analysis, it does confirm the higher psi scoring shown by the Lamas in the previous study. No statistically significant psi scoring was found in the other two groups, although the one Rinpoche who participated in this study had a 50% rank 1 hit rate, as can be seen in Table 1 below.

TABLE 1
Rank Scores for All Participants

Monastic Status	Rank			
	1	**2**	**3**	**4**
Lama 1	2	3	3	0
Lama 2	3	3	0	2
Rinpoche	4	0	2	2
Geshe 1	3	2	1	2
Geshe 2	2	2	3	1
Geshe 3	2	0	2	4
Geshe 4	3	1	0	4
Geshe 5	2	2	1	3
Geshe 6	3	2	1	2
Geshe 7	1	2	2	3
Total	25	17	15	23

All rating scores can be depicted in terms of rank, i.e. the picture chosen as the one the participant thought would be the target is given the highest rating and so can be ranked as their first choice; the next highest rating is ranked their second choice, and so on. This is less sensitive than the rating scores but does give a clear picture of the participants' scoring levels. The raw data for the eight sessions in terms of ranking are shown in Table 1.

From Table 1 it can be seen that overall the participants chose the target picture correctly as their first choice 32% of the time, where mean chance expectancy is 25%. This level of scoring is close to the average for altered states receptive psi research (Radin, 1997:84), and is the same as that found with the swamis (Yogic monks and nuns) in the earlier ashram studies (Roney-Dougal & Solfvin, 2006).

b) Correlation of Psi Score with Number of Years of Meditation Practice

This was designed to replicate a statistically significant positive correlation between the psi scoring of the 11 monks in Study 1 and the number of years that they had practiced meditation, as measured on the MAQ. However, the psi-meditation correlation from Study 1 (Roney-Dougal, Solfvin & Fox, 2008) was potentially inflated by one subject (a Lama), who had far more years of meditation practice than anyone else (32 years), and who had the most positive psi score. To remove the potential artefact, this data was re-analyzed using Spearman (rank) correlation. The revised psi scoring versus years of meditation correlation for Study 1 was still statistically significant (rho = 0.80, n = 11, p = 0.003, 2-tailed.)

In the current study (Study 2), we have a similar situation with the participant (another Lama!) with the most years of meditation practice (40 years) also having the highest psi score (TrDev mean (M) = 0.51). Therefore, this hypothesis has been analyzed using Spearman's (rank) correlation of the participants' overall psi scores with years of meditation practice. The results show a non-significant positive correlation (rho = 0.282, n = 10, p = 0.22, 1-tailed). This correlation is depicted in Figure 2.

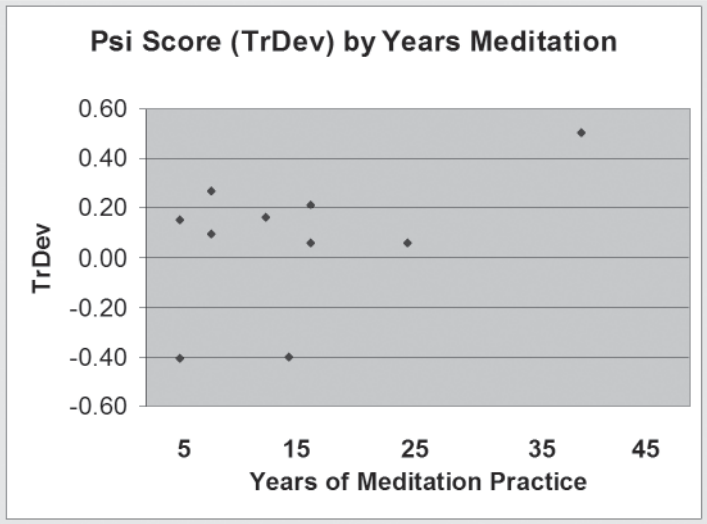


Figure 2. Correlation of psi score with years of meditation practice..

2) Exploratory Hypotheses

a) Comparison of Mantra and Visualization Meditation Technique

The mantra versus visualization hypothesis was analyzed using a participant (10) × instruction set (2) ANOVA with repeated measures. The results show no significant main effects or interaction. The average psi scores were 0.02 (SD = 0.90) and 0.12 (SD = 0.89) for the mantra and visualization instructional sets, respectively ($F(1,79) = 0.26$, $p = 0.61$). Thus, the hypothesis is not confirmed, and the two different sorts of meditation practice did not have a significant impact on the results.

b) Correlation of the other MAQ Variables with Psi Score

The MAQ variables concerning length and frequency of various practices were tested using Spearman's (rank) correlation coefficient for the same reason. The results are shown in Table 1, grouped by length, frequency, and type of practice. None of these variables reached statistical significance when Bonferroni correction (Shaffer, 1995) for multiple analyses is applied. Thus, this hypothesis is not confirmed. In Study 2, we found no significant relationship between psi score and length, frequency, or type of meditation practice. These correlations are shown in Table 2.

TABLE 2
Spearman Correlations (rho) of Psi Score with MAQ Variables

	MAQ Variable[a]	Spearman rho with Psi Score
Years of practice	Meditation years	0.282
	Asana years	0.601[1]
	Prana years	0.230
Total hours of practice	Meditation hours	0.455
	Asana hours	0.647
	Prana hours	0.421
	Ngondros hours	0.620
	Retreat hours	0.624
	Total hours	0.539
Types of meditation	Type 1 (shamatta)	0.351
	Type 3 (visualization)	0.488
	Type 4 (vipassana)	0.190

[1] Note: n = 10 for all correlations except "Asana Years" (8) and "Prana Years" (9).

[a] Elaborating on the variables from the MAQ:
Years of meditation is years of practice of all the various meditation techniques.
Ngondros are preliminary practices such as prostrations and mantra.
Retreat hours: Many of the other variables are included in the retreats, so this variable is not included in the total hours of practice.
Total hours is meditation plus ngondros, asana, and pranayama.
Type 1 is concentration meditation, one-pointed shamatta, equivalent to yogic meditation.
Type 2 is analytic inquiry. Since the Gelugpas included their reading of scriptures, prayers, and debating practice in this type, the the author and David Luke decided prior to analysis that it should not be included either separately in the analysis or in the final meditation hours score, because while it's certainly a fine mental practice it is not what most Westerners consider to be meditation.
Type 3 is visualization meditation.
Type 4 is bodhicitta (compassion) and special insight, which we put together as they are both vipassana techniques.

c) The Stroop Effect

We attempted to incorporate a new measure into this study, attentional focusing ability, assessed by the Stroop. Sadly this attempt failed due to problems with the programming of the computer-based Stroop test and the inexperience of some of the participants with computers. As a result, some of the data is either absent, error-prone, or unreliable. For our own interests, we conducted a basic set of analyses and found no significant correlations.

We believe this remains an interesting variable to include in future studies of meditation and psi. Our original motivation for using the Stroop, that attentional focus ability may play a moderator role between meditation attainment and psi scoring, has yet to be adequately tested.

3) Combining Tibetan Studies 1 and 2

Two studies were conducted with Tibetan Buddhist meditators following the same basic protocol, the Roney-Dougal, Solfvin, and Fox 2008 study and this one. These studies both tested the correlation between years of meditation practice and psi scoring. Small sample statistics are notoriously unstable, so, after having completed both studies, we decided it would be interesting to combine the data from Studies 1 and 2, in order to provide a more stable analysis. The first study originally involved six Western students, one Western nun, and 11 Tibetan Buddhist monks, comprising six Geshes, three Rinpoches, and two Lamas. This second study involved ten monks: seven Geshes, one Rinpoche, and two Lamas. In order to meaningfully combine the results of these two studies, it was necessary to retain only the data from the Tibetan Buddhist monks. This provided a grand total of 18 monks including 11 Geshes, three Rinpoches, and four Lamas, since three monks participated in both studies. Each monk completed eight psi sessions in each study to provide a grand total of 168 trials for analysis. This data is shown in Table 3 and Figure 3.

The psi score was the primary dependent variable for both studies. To combine the psi scores from the two studies, no further scaling is needed. Overall, the psi scores were at chance expectation with $M = -0.04$, $t(167) = -0.613$, $p = 0.541$, 2-tailed. This is a near-zero overall effect size of $r = -0.05$. However, in Study 1 the three Rinpoches scored significantly negatively (psi-missing), while in Study 2 the two Lamas scored significantly positively (psi-hitting). The overall average combined psi score for Lamas was $M = 0.26$, which is marginally statistically significant ($t(31) = 1.89$, $p = 0.068$, effect size $r = 0.32$).

Since three participants in Study 1 also participated in Study 2 (two Geshes and one Rinpoche), to assure that these individuals did not contribute disproportionately to their respective groups, the combined data were adjusted so that each of these three repeat participants had their two 8-session score

TABLE 3
Psi Scores for the Monastic Groups

Group		Study 1	Study 2	Combined
Geshes	M	−0.143	−0.033	−0.089
	SD	0.816	0.932	0.871
	Effect size (r)	−0.18	−0.04	−0.10
	N	48	56	88
Rinpoches	M	−0.318[a]	0.151	−0.278[b]
	SD	0.744	0.879	0.707
	Effect size (r)	−0.40	0.18	−0.37
	N	24	8	24
Lamas	M	0.136	0.386[a]	0.261[b]
	SD	0.873	0.879	0.783
	Effect size (r)	0.16	0.50	0.32
	N	16	16	32
Overall	M	−0.140	0.069	−0.043
	SD	0.812	0.890	0.841
	Effect size (r)	−0.17	0.08	−0.05
	N	88	80	144

[a] $p < 0.05$, 2-tail.

[b] $0.10 < p < 0.05$, 2-tail.

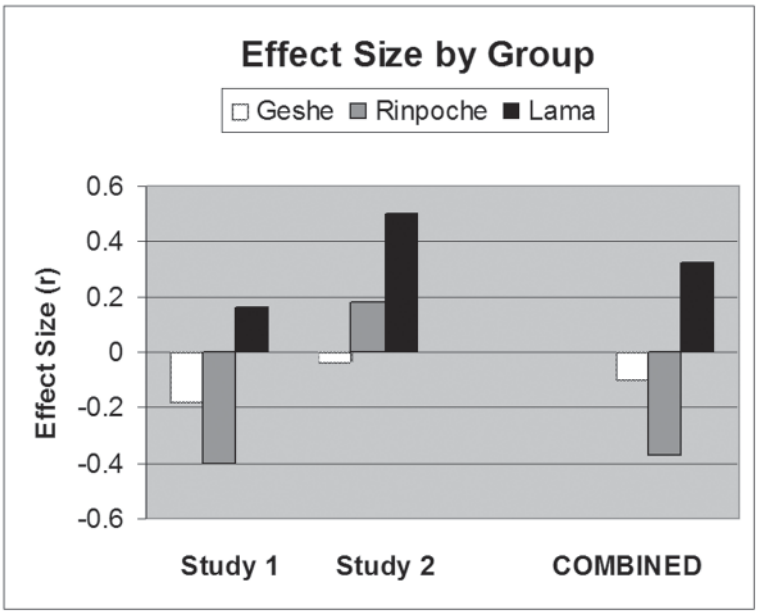


Figure 3. Effect sizes for the three monastic groups.

vectors averaged into a single 8-session sequence. Thus, the total number of sessions is reduced for the combined scores of Geshes by 16 sessions, and Rinpoches by eight sessions.

For *part a*, testing the hypothesis that the Geshes, Lamas, and Rinpoches would show different levels of psi scoring, a three-factor mixed analysis with repeated measures on one factor was conducted (Bruning & Kintz, 1987). This was a time (Study 1, Study 2) by monastic rank (Geshe, Lama, Rinpoche) ANOVA with each participant contributing eight sessions.

The results of this analysis show a statistically significant main effect for monastic rank with no significant interactions ($F(2,15) = 4.33$, $p = 0.033$). No other significant effects were found, although "time" (Study 1 versus Study 2) was marginally significant ($p = 0.062$), reflecting the abundance of low scoring in Study 1. Specific contrasts were conducted to compare the Geshe, Lama, and Rinpoche groups. The Lama group was found to score significantly higher than the Geshe or Rinpoche groups. The ANOVA summary, with contrast analyses, is shown in Table 4 and illustrated in Figure 4.

In *part b* of the hypothesis, the Spearman correlation between years of meditation and average psi score for the combined studies is rho = 0.737,

TABLE 4
ANOVA Summary Table for Combined (Studies 1 and 2) Psi Scoring by Monastic Group by Two Studies

Source	SS	DF	MS	F	p-Value
Total	121.76	167	--		
Between subjects	12.86	20	--		
Time (Study 1, 2)	1.84	1	1.84	4.06	0.062
Rank (Geshe/Lama/Rinpoche)	3.93	2	1.96	4.33	0.033
Error-between	6.80	15	0.45		
Within subject	108.90	147			
Sessions	1.92	7	0.27	0.36	0.90
Time × sessions	3.62	7	0.52	0.68	0.69
Time × sessions	15.33	14	1.10	1.44	0.14
3-Way	7.96	14	0.57	0.75	0.72
Error-within	80.07	105	0.76		
Specific Contrasts					
Lamas vs. Geshes + Rinpoches combined	6.04	1	6.04	13.33	0.002
Lamas vs. Geshes separately	2.15	1	2.15	4.73	0.046
Lamas vs. Rinpoches separately	3.41	1	3.41	7.53	0.02

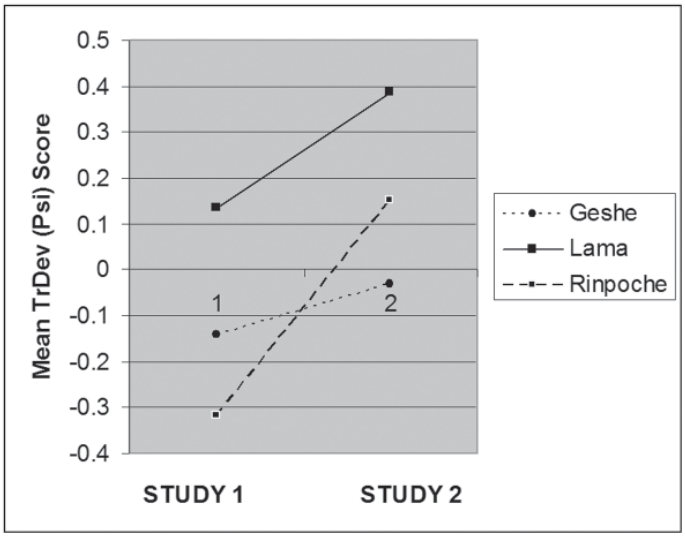


Figure 4. Mean psi scores for Lamas, Rinpoche, and Geshes for Studies 1 and 2.

p = 0.0005, 1-tailed. Thus, the combined Studies 1 and 2 confirm that years of meditation practice is related to increasingly positive and significant psi scoring. This correlation is shown in Figure 5.

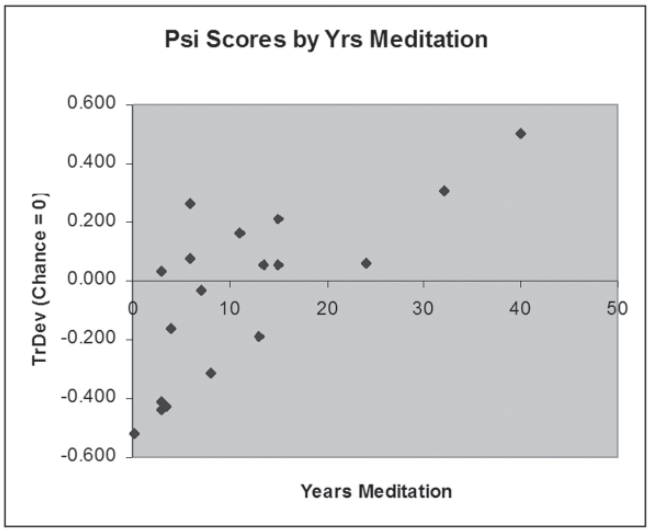


Figure 5. Correlation of psi scores with years of meditation for Studies 1 and 2.

Discussion

As in our earlier studies, the most experienced meditators showed the strongest psi-hitting. Unlike the previous study with Tibetan monks, there was no significant psi-missing, perhaps because most of the monks we worked with had at least three years of meditation practice. The two Lamas had both just completed the 3-year meditation retreat that entitles a monk to be called a Lama, and had both practiced meditation for many years, one Lama having practiced for 40 years. The fact that they showed independently significant results with so small a data sample is impressive, and is an indication of the efficacy of spending three years in silent retreat practicing meditation for 10 hours a day! The Rinpoche in Study 2 and one of the Lamas in Study 1 both, though not independently significant, obtained a pretty impressive 50% direct-hit rate, where 25% is mean chance expectancy. In Study 2, one Lama chose the target with a 100-rating three times.

It was the earlier ashram studies (Roney-Dougal & Solfvin, 2006, Solfvin & Roney-Dougal, 2010) that suggested the design of participants doing multiple sessions, thus enabling a reasonable assessment of each individual's psi scoring level, and it was here that we first noticed that the more advanced practitioners showed a greater consistency in their psi scoring. In other words, the participants who had practiced meditation for only a few years showed the typical scoring patterns of sometimes below chance, sometimes at chance, and sometimes above chance, whereas the advanced practitioners consistently scored in the above-chance direction. This pattern has been repeated with the two Tibetan studies where the Lamas have consistently scored in the psi-hitting direction. Therefore, all four studies have shown a consistent psi-hitting trend from the more advanced practitioners. Of course, the experimenter effect cannot be ruled out either at the psychological or the parapsychological levels, since all studies were run by the same experimenter. However, this is perhaps lessened by the need to use a translator, and in the Tibetan studies the most significant scoring was from those participants who spoke no English at all.

Similarly, the correlation of years of meditation in itself is a reasonably strong correlation, which is non-significant in this study merely from the lack of power, and is similar enough to our previous three studies to support the conclusion that years of meditation practice is related to a shift in consciousness which enables more reliable psychic awareness to manifest, thus corroborating the Buddhist and Yogic teachings. When we combine the data from both Tibetan studies, the highly significant correlation corroborates this conclusion.

With regard to the exploration of the effect of different types of meditation, mantra versus visualisation, this is just an initial pilot study. Of all the MAQ correlations of the different meditation practices with psi score, it is the visualization practice that gives the strongest correlation, though with these

small numbers this is not significant. Thus, those people who had done the greatest amount of visualization practice were those who showed the strongest and most reliable psi, i.e. the Nyingma Lamas. So, while doing the visualization practice during the session appears to have little differential effect on psi scoring, doing it long term does possibly appear to have an effect. This ties in with the findings by Carter et al. (2005) in which the shamatta practice gave the strongest effect. It also corroborates the Yogic Tantric practices and teachings, the Tibetan practice of visualization in lakes for psychic purposes, and other traditions around the world, e.g., scrying in Britain. Of interest with regard to the Lamas is that in their meditation retreat they had practiced mantra with visualisation—chanting mantra of a deity while visualizing that deity. So they were not able to separate the two practices. They both remarked on this in the interviews with them after completion of the psi sessions.

Breaking down the meditation practice into its various components leads to some interesting, albeit very preliminary findings. The Nyingma Lamas practice included asanas, pranayama, and the retreat, all of which showed the strongest correlations with psi. The Gelugpas do not normally do these practices. Thus the significant findings for the different variables are primarily due to the Lamas. These results support the preliminary studies done in the ashram (Roney-Dougal & Solfvin, 2006), where we found positive correlations (albeit non-significant) between years of yogic practice, which includes all these practices, and psi. Thus we can tentatively say that, while meditation appears to have the most profound effect on consciousness, as measured by psi awareness, the other practices do all play a part.

Conclusions

Overall, the hypothesis, that mantra versus visualization meditation within the session would differentially affect psi scoring, was not confirmed, though lengthy practice in visualization meditation showed the strongest correlation with psi-hitting. The hypothesis that meditation attainment, as measured by years of practice, would correlate significantly with performance on the psi task, was confirmed overall when both studies are combined. Additionally, those practitioners, the Lamas, who had greater meditation experience showed independently significant psi-hitting. Thus, for a third time, this study shows that years of practice of meditation is related to a change in consciousness in which more consistent and reliable psi awareness is manifested. This confirms the Buddhist and Yogic teachings that, as you practice meditation, so, little by little, the changes occur. Finally, this study has begun a preliminary investigation into which practices are most efficacious, and tentatively suggests that it may be the shamatta meditation practice of visualisation which is the most psi-conducive meditation technique.

Acknowledgments

Deep gratitude to His Holiness, Dalai Lama, whose request for science to investigate Tibetan psychic traditions initiated this study; to Perrott-Warrick Fund and Bial Foundation, grant no. 64/04, for their financial support of this research, without which it could not have happened; to Tenzin Geyche Tethong, whose support enabled the grants to be obtained; to Geshe Jampel Dhakpa of Sarah College, who affiliated this project to the Sarah Institute and guided and assisted all the way; to Khangser Rinpoche, for his assistance in enabling the research to take place at Sera Jey Monastic University; to His Holiness, Penor Rinpoche, for enabling the research to take place at Namdroling monastery, and to Khenpo Rinpoche, Acharya Geshe Lobsang Palden of Sera Jey for his support; to the translators, Gen Andu at Sera Jey, and Orgyen Norbu at Namdroling; to all the participants who shared most kindly of their time and expertise; to Guru Tinley and Choegyal Wandu for helping to find the translator and participants at Namdroling; to Acharya Ngawang Nyima for help finding participants at Sera Jey; to "Science Meet Dharma" for their support of this project at Sera Jey; to Chockor Rinpoche for his excellent recording of the instructions in Tibetan used by so many participants and to Gen Tenzin for doing the translation; to David Luke and Geshe Dorje Dumdal for help with the questionnaire; to Ed May for help with the analysis; to Chris Roe for help with grant application, and support along the way; to Bradley Rowe for his beautiful photos which were used as target pictures; to Jessica Utts for advice on the statistical analysis; and to the two referees whose comments helped to significantly improve the quality of this paper. May this research be for the benefit of all beings.

References

Bierman, D. (2007). Presentiment in a fMRI experiment with meditators. Presentation at the Euro-Parapsychological Association Convention, Paris, 28 October 2007.

Bruning, J. L., & Kintz, B. L. (1987). *Computational Handbook of Statistics (3rd Ed.).* Glenview, IL: Scott, Foresman & Co.

Carter, O. L., Presti, D. E., Callistemon, C., Ungerer, Y., Liu, G. B., & Pettigrew, J. D. (2005). Meditation alters perceptual rivalry in Tibetan Buddhist monks. *Current Biology*, *15*(11), R412.

Field, B. (2008). Personal communication with Brent Field, February 18, February 20, June 23, 2008. For more information, go to www.mindandlife.org.

Khangser and Khensur Rinpoches (2006). Personal communication, May 8, 2006.

Radin, D. (1997). *The Conscious Universe: The Scientific Truth of Psychic Phenomena.* San Francisco: Harper, pp. 73–89.

Roney-Dougal, S. M. (2006). Taboo and belief in Tibetan psychic tradition. *Journal of the Society for Psychical Research, 70*(4)*,* 193–210.

Roney-Dougal, S. M., & Solfvin, J. (2006). Yogic attainment in relation to awareness of precognitive targets. *Journal of Parapsychology, 70*(1)*,* 91–120.

Roney-Dougal, S. M., Solfvin, J., & Fox, J. (2008). An exploration of degree of meditation attainment in relation to psychic awareness with Tibetan Buddhists. *Journal of Scientific Exploration, 22*(2), 161–178.

Shaffer, J. P. (1995). Multiple hypothesis testing. *Annual Review of Psychology, 46,* 561–584.

Solfvin, J., & Roney-Dougal, S. M. (2010). A re-analysis and summary of data from a study of experienced versus novice yoga practitioners. In: K. Ramakrishna Rao (Ed.), *Yoga and Parapsychology: Empirical Research and Theoretical Studies,* Delhi: Motilal Banarsidass.

Stanford, R .G., & Sargent, C. L. (1983). Z scores in free-response methodology: Comments on their utility and correction of an error. *Journal of the American Society for Psychical Research, 77,* 319–326.

Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology, 18*, 643–662.

Ullman, M., Krippner, S., & Vaughan, A. (1973). *Dream Telepathy: Experiments in Nocturnal ESP.* New York: Macmillan Publishing.

White, R. A. (1964). A comparison of old and new methods of response to targets in ESP experiments. *Journal of the American Society for Psychical Research*, *58*, 21–56.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 47–62, 2011 0892-3310/11

RESEARCH

A Faulty PK Meta-Analysis

Wilfried Kugel
Berlin

Submitted August 26, 2009; Accepted November 3, 2010

Abstract—This article starts with an introduction to the concepts and experimental methodology used in the investigation of micro-psychokinesis (micro-PK). After a summary of three PK meta-analyses that seem to show a genuine PK effect, I will comment on a paper by Holger Bösch, Fiona Steinkamp, and Emil Boller (BSB), entitled "Examining Psychokinesis: The Interaction of Human Intention With Random Number Generators—A Meta-Analysis" (BSB-MA). The paper was published in the July 2006 issue of the *Psychological Bulletin* and suggests that all evidence of micro-PK may be due to publication bias. I will then show that the BSB-MA contains a large number of serious errors, which include data selection bias, faulty data coding, a lack of correspondence between experimental and control datasets, faulty statistical analyses, and erroneous interpretation of results. In addition, the entire negative z-score in the meta-analysis results from only one study. This meta-analysis, therefore, produced spurious results.

Terms and Methods

In accordance with the definitions published by the Rhine Research Center (Durham, NC, USA), the term *parapsychology* describes the scientific study of certain paranormal or ostensibly paranormal phenomena, in particular ESP and PK (or Psi, as a general term used either as a noun or adjective to identify ESP or PK). Extrasensory perception (ESP) denotes paranormal cognition; the acquisition of information about an external event, object, or influence (mental or physical; past, present, or future) in some way other than through any of the known sensory channels. ESP includes telepathy and clairvoyance. Precognition denotes a form of ESP involving awareness of some future event that cannot be deduced from normally known data in the present. Psychokinesis (PK) denotes paranormal action: the influence of mind on a physical system that cannot be entirely accounted for by the mediation of any known physical energy.

In a test of ESP, a target is defined as the object or event that the percipient attempts to identify through information paranormally acquired. In a test of PK, a target is defined as the physical system, or its effect, that the subject attempts to influence.

There are so-called macro-Psi and micro-Psi experiments. Typically, "macro-experiments" are closely related to spontaneous experiences and are performed under more or less informal conditions, whereas micro-experiments are performed under strictly controlled laboratory conditions. This paper will only look at micro-experiments.

Target sequences are typically generated by a random number generator (RNG), also called a random event generator (REG), an apparatus (typically electronic) incorporating an element capable of generating a random sequence of outputs. In tests of PK, the RNG may itself be the target system that the subject attempts to influence. Typical physical processes underlying a true RNG are electronic "white noise" and radioactive decay. "White noise" diodes are very susceptible to electromagnetic disturbances. RNGs based on radioactive decay are the best choice because this process and its statistical character cannot be influenced by any known human means (including electromagnetic disturbances).

A pseudo random number generator (PRNG) is an algorithm for generating a sequence of numbers that approximate the properties of a true random number series. The sequence is not truly random in that it is completely determined by an initial value ("entry point" or "seed"). In practice, the output of many common PRNGs (including the random functions of PCs and Macintoshes) exhibit artifacts. A common way to generate pseudo random numbers is to generate a "seed value" for an entry in the decimal digits of an irrational number such as π or e. (The decimal representation of an irrational number never ends or repeats.) PRNG-generated number sequences are not at all proper targets for either PK or precognition experiments.

Let us look at how a typical PK experiment is designed: In a fixed group of successive trials, called a run, the subject attempts to influence the outcome of an RNG. At least one independent control run (better if there are more) must be performed with the same RNG but without any attempt by the subject to exert intentional influence on the outcome. In a successful experiment, the control runs show no significant deviation from the theoretically expected random series, where the run intentionally influenced by the subject shows such a significant deviation from chance expectation, as measured by statistical methods such as the Binomial Test, the Chi^2-Test, and others.

In 1976, Helmut Schmidt introduced the hypothesis of a "PK Effect on Pre-Recorded Targets" (Schmidt, 1976), i.e. whether direct mental influences might occur in a time-displaced or "backward-acting" manner.[1]

The "Decision Augmentation Theory" (DAT) by May et al. (1985, 1995a, 1995b, 1995c)[2] reconceptualized PK as a precognition-based selection process rather than one of actual influence. This means that the subject of a PK experiment or even the experimenter may "foresee" when and where a natural statis-

tical fluctuation in the generation of target bits appears and choose the right moment and place to start the recording of the target sequence. This basic problem—that the result of a PK experiment may depend only on when and where the target bits are generated—cannot be avoided in any experimental design.

The design of a precognition experiment differs considerably from the design of a PK experiment: The subject's role in a precognition experiment is not to influence, but to foresee the outcome of an RNG. To exclude artifacts produced by malfunctions of the RNG, the random series produced by the RNG must always fit the a priori theoretical expectation under all circumstances. In principle, no control runs are necessary as long as the RNG produced random numbers, as statistically expected. (This is true for all other ESP experiments as well.) Although it is conceivable that in precognition experiments a PK influence may transform one random series into another one, there is no way such an effect can be measured.

A meta-analysis (MA) sums up several individual studies and attempts to give an overall result. Because of the different paradigms, no ESP experiments may be included in a PK meta-analysis. ESP studies need target sequences that correspond to chance expectation, whereas PK studies measure the deviation of target sequences from chance expectation. Therefore, if ESP studies are merged with PK studies in a PK-MA, the overall result should be closer to random expectation if more ESP studies are included.

On the other hand, PK studies could be included in precognition meta-analyses, since it is possible that in PK experiments the subject may "foresee" upcoming deviations of the RNG output from chance expectation (as conceptualized by the DAT).

Previous PK Meta-Analyses

Prior to 2006, three meta-analyses (MAs) of PK experiments were made.[3] I shall refer to these meta-analyses as RN1, RN2, and RN3, respectively. (For a comparison of these analyses, see Table 1.)

RN1 Meta-Analysis

RN1 (Radin & Nelson, 1989) examined the following hypothesis: "The statistical output of an electronic RNG is correlated with observer intention with prespecified instructions, as indicated by the directional shift of distribution parameters (usually the mean) from expected values." The random event output of the RNGs, investigated in the RN1, originated in electronic noise, radioactive decay, or randomly seeded pseudo random sequences.

The RN1 examined all available 152 references from 1959 to 1987, covering 597 experimental PK studies, including 258 studies from the Princeton

TABLE 1
Comparison of the Results of 4 PK Meta-Analyses

META-ANALYSES Time Period	RN1 (1989) 1959–1987	RN2 (1997) 1959–1996	RN3 (2003) 1959–2000	BSB (2006) 1969–2004
Total studies	597	339	515	380
Non-PEAR studies included	339	339	number n.r. > 339	
PEAR studies included	258	0	258 (collapsed to 1) + number n.r.	32 (partly collapsed to 1)
Additional non-PEAR studies (update)	--	0	176 (including PEAR studies)	yes, number n.r.
Additional PEAR studies (update)	--	1,004	number n.r.	26 (partly collapsed to 1)
PEAR studies excluded	--	258	0	yes, number n.r.
PK studies excluded	--	0	0	yes, number n.r
ESP studies included	no (not verified)	no (not verified)	yes (supplied by BSB), number n.r.	yes, > 30
z	>+12 (with PEAR, according to RN3) +6.53 (with PEAR, according to BSB)	+6.41 (without PEAR)	+16.1 (with PEAR) +3.81 (according to BSB)	-3.67 (with PEAR) +3.59 (without fast PEAR"Mega")
PEAR studies separated	0	258	0	0
PEAR studies total	258	1,262	258 (combined to 1) + number n.r.	32
PEAR z	significantly positive, value n.r.	significantly positive, value n.r.	significantly positive, value n.r.	negative, value n.r.

n.r., not reported

Engineering Anomalies Research Laboratory (PEAR). A highly significant effect (z = 6.53) was found.

Bösch, Steinkamp, and Boller (BSB) criticized RN1 as follows:

> The authors did not [...] specify definite and conclusive inclusion and exclusion criteria. [...] Participants in the included studies varied from humans to cockroaches [...] The meta-analysis included not only studies using true RNGs, which are RNGs based on true random sources such as electronic noise or radioactive decay, but also those using pseudo-RNGs [...], which are based on deterministic algorithms. (Bösch et al., 2006:501)

RN2 Meta-Analysis

In RN2, (Radin, 1997), Dean Radin revisited the RN1 and calculated an experimental effect of ≈51% ($p < 10^{-12}$). For a replication analysis, Radin

separately examined all PEAR experiments and updated the database to 1996, which included a total of 1,262 PEAR studies. He stated:

> Princeton University mathematician York Dobyns found that the seven years of new PEAR RNG results closely replicated the preceding three decades of RNG studies reviewed in the meta-analysis [RN1]. That is, our 1989 prediction had been validated. [...] Roger Nelson [...] found that the main RNG effect for the full PEAR database of 1,262 independent experiments [...] was associated with odds against chance of four thousand to one (Nelson et al., 1991) [$p \approx 0.00025$]. (Radin, 1997:142f)

But BSB derogated the method used in RN2:

> Radin (1996) [sic] recalculated the effect size of the first RNG meta-analysis, claiming that the "overall experimental effect calculated per study, was about 51%" (p. 141). However, this newly calculated effect is two orders of magnitude larger than the effect of the first RNG meta-analysis (50.018%). The increase has two sources. First, Radin removed the 258 PEAR laboratory studies included in the first meta-analysis (without discussing why) and second, he presented simple mean values instead of weighted means as presented 10 years earlier. (Bösch et al., 2006:501)

RN3 Meta-Analysis

In 2003, an update (RN3) of the previous meta-analyses by Dean Radin and Roger Nelson was published. The paper states:

> A literature review found 64 new publications describing 176 RNG experiments that were not retrieved in the earlier meta-analysis [...]. Of these 176 experiments, 84 were reported up to 1987 and 92 after 1987. The new publications included a description of the 20-year PEAR RNG program, thus the 258 PEAR lab experiments reported separately in MA-1989 were collapsed into a single data point for the purposes of the present [...] analysis. This resulted in combining 339 non-PEAR experiments from the MA-1989 database along with 176 new studies, for a total of 515 studies. [...] The average effect size per random event over these 515 studies, expressed in terms of a percentage over chance expectation assuming a binary RNG, was 0.7%. Overall this cumulated to 16.1 standard errors from chance ($p \ll 10^{-50}$). (Radin et al., 2003)

But in contrast to $z = 16.1$, BSB reported a z-score of only 3.81.

Let us look at how Radin and Nelson found the "new publications" they mentioned in RN3 (as quoted above). In August 2000, Roger Nelson sent a request to the IGPP ("Institut für Grenzgebiete der Psychologie und Psychohygiene" in Freiburg, Germany) for additional studies to be included in an updated version (RN3) of the RN1 PK meta-analysis. In an e-mail to me on November 4, 2007, Nelson stated that the new studies (including some that were done but not found during the period of the earlier RN1) were aggregated

by Bösch and Boller, and assessed mainly by Steinkamp. (This was not the database of the later BSB-MA.) Roger Nelson appended a description and a list of the additional data. To my surprise, I found the results of two of my 1979 telepathy studies (TELBIN VOR, TELBIN S-SS) in the list that Roger Nelson sent me. Not only did these ESP studies not belong there, but none of the values given are correct. Moreover, arbitrarily selected results of my 1980–1999 precognition studies (A through D; see: Kugel, 1992, 1999), including series A and B, in which physical roulette wheels were used, were also included.

On November 5, 2007, Roger Nelson informed me that all the items in the list he had sent me were courtesy of Bösch et al. and that he had not been aware that they included inappropriate studies in the RN3.

Criticizing the RN3-MA in 2006, BSB unequivocally quoted that "no inclusion and exclusion criteria were specified" (Bösch et al., 2006:501). But the fact is that BSB themselves, by adding arbitrarily studies to the RN3-MA database, included selected ESP data. This was not consistent with the inclusion and exclusion criteria later specified by BSB themselves.

The 2006 PK Meta-Analysis by Bösch, Steinkamp, and Boller

In the July 2006 issue of the *Psychological Bulletin*, Holger Bösch, Fiona Steinkamp, and Emil Boller published a paper entitled "Examining Psychokinesis: The Interaction of Human Intention With Random Number Generators—A Meta-Analysis" (Bösch et al., 2006) (BSB-MA).

The 2006 BSB-MA was part of a five-year consortium project on RNG experiments. The consortium was established in 1996, lasted through 2000, and was funded by the IGPP.

> The consortium comprised research groups from the PEAR laboratory (Princeton Engineering Anomalies Research Laboratory, Princeton University, School of Engineering/Applied Science, Princeton, New Jersey, USA, founded in 1979 and closed in 2007); the Justus Liebig University of Giessen, Giessen, Germany (GARP); and the Institut für Grenzgebiete der Psychologie und Psychohygiene (Institute for Border Areas of Psychology and Mental Hygiene) in Freiburg, Germany (FAMMI). (For the results, see Jahn et al., 2000)

BSB summarized the results of their MA as follows:

> The meta-analysis combined 380 studies that assessed whether RNG output correlated with human intention and found a significant but very small overall effect size. The study effect sizes were strongly and inversely related to sample size and were extremely heterogeneous. A Monte Carlo simulation revealed that the small effect size, the relation between sample size and effect size, and the extreme effect size heterogeneity found could in principle be a result of publication bias. (Bösch et al., 2006:497)

BSB described the inclusion and exclusion criteria of the studies they used for the MA as follows:

> After the comprehensive literature search was conducted, we excluded experiments that
>
> (a) involved, implicitly or explicitly, only an indirect intention toward the RNG. For example, telepathy experiments, in which a receiver attempts to gain impressions about the sender's viewing of a target that is randomly selected by a true RNG, were excluded (e.g., Tart, 1976). Here, the receiver's intention is presumably directed to gaining knowledge about what the sender is viewing rather than to influencing the RNG. We also excluded those that
>
> (b) used animals or plants as participants (e.g., Schmidt, 1970b);
>
> (c) assessed the possibility of a nonintentional or only ambiguously intentional effect, for instance, experiments evaluating whether hidden RNGs could be influenced when the participant's intention was directed to another task or another RNG (e.g., Varvoglis & McCarthy, 1986), or experiments with babies as participants (e.g., Bierman, 1985);
>
> (d) looked for an effect backward in time [retro-PK] or, similarly, in which participants observed the same bits a number of times (e.g., Morris, 1982; Schmidt, 1985), and
>
> (e) evaluated whether there was an effect of human intention on a pseudo-RNG (e.g., Radin, 1982).
>
> In addition, experiments were excluded if their outcome could not be transformed into the effect size that was prespecified for this meta-analysis. This excluded studies for which the data are not expected to be binomially distributed. As a result, for example, experiments that compared the rate of radioactive decay in the presence of attempted human influence with that of the same element in the absence of human intention (e.g., Beloff & Evans, 1961) were excluded. [...] From the 372 experimental reports retrieved, 255 were excluded after applying the inclusion and exclusion criteria.

Confirming this, in an email of November 7, 2007, Fiona Steinkamp informed me that studies using pseudo-RNGs [e] as well as retro-PK studies [d] were excluded from the BSB-MA, as well as studies that assessed random decay of a radioactive source only, since an output was needed that was a clear 1 or 0 for a study to be included.

Published Responses to the BSB-MA

Two responses to the BSB-MA were published in the same July 2006 issue of the *Psychological Bulletin*, following the original paper.

Wilson et al. summarized only the intention of the BSB paper:

> The authors argue that, for both methodological and philosophical reasons, it is nearly impossible to draw any conclusions from this body of research. [...] If we had to take a stand on the existence of an RNG psychokinesis effect on the basis of the evidence in Bösch et al., we would probably vote no. (Wilson & Shadish, 2006:524, 527)

Radin et al. stated:

> Bösch et al. postulated the heterogeneity is attributable to selective reporting and thus that psychokinesis is "not proven". [...] The authors maintain that selective reporting is an implausible explanation for the observed data and hence that these studies provide evidence for a genuine psychokinetic effect. [...] Bösch et al. excluded two thirds of the experimental reports they found.

Furthermore, Radin et al. mentioned errors in the statistical treatment of the MA by BSB (Radin et al., 2006:529, 531).

The *Psychological Bulletin* gave BSB the opportunity to reply to the two comments. The reply was also published in the July 2006 issue. BSB stated that their

> meta-analysis [...] demonstrated (a) a small but highly significant overall effect, (b) a small-study effect, and (c) extreme heterogeneity. [...] The authors reaffirm their view that publication bias is the most parsimonious model to account for all 3 findings. (Bösch et al., 2006a)

Timm stated at the November 2006 workshop of the "Wissenschaftliche Gesellschaft zur Förderung der Parapsychologie" (WGFP) that Bösch et al. based their work on unrealistic assumptions about the structure of parapsychological experiments. After correcting the statistical analysis, he arrives at a highly significant value for the existence of PK and states that the attempt by Bösch et al. to attribute the PK results to publication bias is untenable (Timm, 2006). At the same workshop, Ertel also pointed out that the BSB-MA contained statistical errors, and that effect of publication bias was negligible. He, too, attributed the results to a genuine, overall PK effect (Ertel, 2006).

Boller rejected the criticism of Timm and Ertel as spurious. It only addressed the general problems of PK research, he said, but not specifics of the BSB-MA (Boller, 2007).

Unfortunately, none of the authors who commented on the BSB-MA mentioned that the entire database of this PK-analysis was assembled incorrectly by including arbitrarily selected ESP data, presumably because they were not aware of this important fact.

My Criticism of the BSB Meta-Analysis

The Subject Matter

BSB conceded that they faced a difficulty:

> Deciding which experiments to include and which to exclude, even if the criteria are clearly defined, can be as delicate as are decisions concerning how to perform the literature search and decisions made during the coding procedure." (Bösch et al., 2006:503)

But were the authors capable of handling that difficulty? Defining the subject matter of their MA clearly seems to have posed a problem for them. Although references to the DAT appear in the BSB paper as sources (May et al., 1985, 1995a), there is no reference to it in the text. They did not take into consideration that PK experiments can be included in a precognition MA, but not vice versa.

PK Data Mixed with Arbitrarily Selected ESP Data

The title and the text of the paper states clearly that the subject matter of the MA is psychokinesis (PK). BSB state (Bösch et al., 2006:502): "The final database included only experimental reports that examined the correlation between direct human intention and the concurrent output of true RNGs." It follows that only genuine PK experiments should have been included in the BSB-MA.

The BSB paper fails to mention that ESP (Extrasensory Perception) studies, presumably mainly precognition studies, were also included in the MA.

Holger Bösch provided me with some original SPSS data files, in particular, "Experimental Data Description," "Experimental Data," "Control Data Description," and "Control Data."

According to a table in the file "Experimental Data Description," the "380 studies fulfilling our inclusion and exclusion criteria" covered 302 PK studies (79.5%), 40 precognition studies (10.5%), 4 mixed studies (1.1%), and 34 "other" studies (8.9%), whatever "other" may mean.

Confronted with my criticism regarding the inclusion of ESP studies in a PK-MA, Emil Boller wrote to me on September 27, 2007, that, to his knowledge, many authors in parapsychology agree that PK and precognition cannot be distinguished unambiguously. His co-authors, he stated, shared this opinion. Therefore, Boller argued, precognition experiments using genuine random number generators had to be included in the BSB-MA. Fiona Steinkamp made a similar argument when she wrote to me on November 7, 2007, that the BSB-MA, in keeping with the inclusion criteria, could include precognition studies as long as there was an intention to obtain a result in a specified direction and a true RNG was used. She added that the BSB-MA was not defined as a PK meta-analysis. But this is clearly not the case and contradicts even the title of the BSB paper, "Examining Psychokinesis: ...". BSB knew that

> PK [Psychokinesis] refers to the apparent ability of humans to affect objects solely by the power of the mind, and ESP relates to the apparent ability of humans to acquire information without the mediation of the recognized senses or inference. (Bösch et al., 2006:497)

But what do the authors mean by "human intention"? They write: "The participants' intention is generally directed (by the instructions given to them) . . . ".

And they explain:

> Telepathy experiments, in which a receiver attempts to gain impressions about the sender's viewing of a target that is randomly selected by a true RNG, were excluded [...]. Here, the receiver's intention is presumably directed to gaining knowledge about what the sender is viewing rather than to influencing the RNG. (Bösch et al., 2006:510, 502)

But the same is true for precognition experiments, where the receiver's intention is presumably directed to gaining knowledge about the RNG's outcome, but not directed by any instructions to influence the outcome of the RNG.

I was surprised that two of my experimental reports from 1979 and 1999 were marked with an asterisk as included in the BSB-MA (Bösch et al., 2006: 517, 520), which covered one telepathy study (Kugel et al., 1979) and four precognition studies (Kugel, 1999), i.e. ESP, but not PK. I will examine this in more detail below and will show that the BSB-MA is, in large part, highly questionable.

Here is a striking example of what I would call "selection bias" in the BSB-MA: In my experiments, I used the following random sources: In 1971, random number tables, freshly generated by a computer; in 1972, a high-frequency electronic ring-counter driven by "White Noise"; in 1973, a high-frequency electronic ring-counter driven by "White Noise" and additionally distorted by radioactive decay; and from 1979 on, RNGs driven exclusively by radioactive decay. All of my experiments are described in the research reports (No. 1 to No. 6) I submitted to the Psychological Institute and later (No. 7 and No. 8) to the Institute for Applied Informatics of the Technical University Berlin. All these reports were available for BSB in the archive of the IGPP. But only arbitrarily selected parts of report No. 7 were included in their MA, namely parts of TELBIN and MM, but the latter was not listed in the BSB references.

I will now turn to the results of my own precognition experiments, published in 1999 and inappropriately used by BSB. From the 4 studies (A through D), only two, studies C and D, were included in the BSB-MA, because those were the only two studies with electronic RNGs.[4] In my 1999 paper I explicitly stated "that in series D, there was no PK influence" (Kugel, 1999:142). BSB's file "Experimental Data" includes z-scores (−0.24; −0.36) only provided as side information. In my paper, I made it clear that "there was no hypothesis with respect to these scores." The z-scores under the (one-tailed) hypothesis of high scoring (+1.06 and +2.19) do not appear in the BSB-MA. This selection by BSB appears to be biased. The output of the RNGs was analyzed extensively before, during, and after the precognition experiments, and was found to be completely random. No control runs of series C and D were included in the BSB-MA, although a copy of my research report (Kugel, 2000) on these series has been available to the authors in the archive of the "Institut für Grenzgebiete

der Psychologie und Psychohygiene e.V., Freiburg i.Br." (IGPP) since the year 2000.

Inclusion and Exclusion Criteria

BSB had stated: "We have a list of 225 [correct number is 255] reports that did not meet our criteria, and it is available to anyone who asks" (Bösch et al., 2006a:536). Ignoring my request, BSB did not send me the list. This lack of information prevented me from looking at some of the issues in more detail.

Apparently, PK studies investigating the possible influence on radioactive decay were excluded because BSB were unable to handle the data statistically. Moreover, other studies were also excluded or only summarized, despite the stated criteria.

Radin, Nelson, Dobyns, and Houtkooper stated in 2006:

> Bösch et al. excluded two thirds of the experimental reports they found. [BSB found 372 reports on relevant experiments. But only 117 were used in their MA.] That selection may have introduced important factors that the reader cannot evaluate. In any case, the exclusion of data with a nonbinomial distribution, such as studies based on radioactive decay, is questionable. (Radin et al., 2006:531)

According to BSB's file "Experimental Data" only six data points of the pre-2000 PEAR studies were included, two of them covering several studies, collapsed to one data point each. These six data points cover PEAR studies until 1994 (according to Nelson, 1994) and include 483.69 million trials. But according to a summary published in 1997 by Jahn et al. (Jahn et al., 1997), the number of trials of PEAR experiments in a 12-year program (Jahn et al. did not report the exact time period) was about 499.44 million trials. This shows that from 1994 on, data of the pre-2000 PEAR studies were excluded from the BSB-MA. Furthermore, only some of the data from a 2004 PEAR study were included in the BSB-MA (Dobyns et al., 2004). Radin, Nelson, Dobyns, and Houtkooper criticized this in 2006:

> The reference in question reports two experiments, only one of which Bösch et al. considered. Of the two experiments, one is subdivided into three phases, each generating two data sets per phase, producing a total of seven data sets that can be distinguished as separate studies. (Radin et al., 2006:530)

This corresponds to my findings, as reported here, and clearly shows that BSB chose their database arbitrarily.

In their reply to Radin et al., BSB wrote:

> Meta-analytic results can be distorted [...] by the selection of publications to insert in the meta-analytic database. Even the most well-intentioned, comprehensive search strategy aimed at including published as well as unpublished

> manuscripts can be fallible. We do not deny that we inadvertently missed some relevant reports, despite having done our best to contact all researchers in the field and to search through all relevant journals and other publications. (Bösch et al., 2006a:536)

But BSB did not even try to contact me.

Inadequate "Control Data"

372 experimental reports were retrieved for the BSB-MA, but only 137 corresponding control studies. How did BSB define control studies?

> Many experimenters performed randomness checks of the RNG to ensure that the apparatus was functioning properly. These control runs were coded in a separate "control" database. [...] The purpose of control studies is to demonstrate that, "without intention," the apparatus produces results (binomially distributed) as expected theoretically.

Moreover, they wrote: "The control studies in this meta-analysis were simply used to demonstrate that the RNG output fits the theoretical premise (binominal distribution)" (Bösch et al., 2006:503,514). But despite their use of the term "corresponding control studies," they state, on the same page: "We have coded and analyzed unattended randomness checks as 'control' studies." This is an arbitrary decision, as I was able to show when I examined the SPSS file "Control Data": From my 1979 telepathy study (TELBIN), BSB arbitrarily took two of six pre-experimental hardware tests of the RNGs at 4,000 trials each. But why only two? Furthermore, the two hardware tests taken had nothing to do with the experiments, and the corresponding experiments were not included in the experimental database. BSB could just as well have used arbitrary series from random number tables. For the RNG tests, no target was set and the randomness check was done with the Chi^2-test. The Chi^2-value always has a positive sign. But from these Chi^2-values, BSB calculated two z-scores. With one of the values they were lucky, because the Chi^2-value was 0, giving $z = 0$. But the other z-value was given a negative sign! Everyone familiar with statistics knows this is strictly prohibited if the direction of the deviation is not known.

Faulty Data Coding

An equally striking example of questionable procedure is the data coding in the BSB-MA. In the case of my data, according to BSB's SPSS files "Experimental Data Description," "Experimental Data," "Control Data Description," and "Control Data," this was done by Emil Boller as "first coder No. 2". BSB included 20 items in their control database, taken from one of my studies ("MM"). MM is not listed as a reference by BSB, but published in the same research report as TELBIN in 1979. This exploratory study in a five-

alternatives design included four telepathy experiments and two PK experiments of 250 trials each. Twenty random series of 250 trials each were generated as tests of the RNG. Only p-values of these 20 Chi^2-tests were reported by me. Notwithstanding the fact that the data of these 20 tests were not binomially distributed, BSB's files show 20 negative z-scores, which according to the file "Control Data" "had to be estimated from p values supplied". The corresponding (and statistically not significant) results of the two PK experiments of my study MM were reported only as two p-values, but combined into one completely fictional positive z-score by BSB. (A comment in the file "Experimental Data" says: "did stouffer z on both studies and then estimated hits—z was 0.38891"). These are serious errors in data coding.

Summary

For a comparison of all PK-MAs, including the BSB-MA, see Table 1.

The 2006 BSB-MA contained 302 PK studies, only 71.4% of the 423 studies, originally published in 1989 in the RN1. More than 40 non-PK (mainly ESP) studies were added to the database. It stands to reason, therefore, that the end result strongly differs from the previous meta-analyses.

As mentioned in the beginning of this paper, ESP studies need target sequences that correspond to chance expectation, whereas PK studies measure the deviation of target sequences from chance expectation. Therefore, if ESP studies are merged with PK studies in a PK-MA, which measures the deviation from chance, the overall result should more closely approximate random expectation when more ESP studies are added. In the BSB-MA, 40 of the 302 studies were ESP studies. This significantly reduces the overall result of the PK studies.

Let's look at the overall result of the BSB-MA. In their summary, BSB claim to have found two results, "a significant but very small overall effect size" ($z = -3.67$) and "that the small effect size, the relation between sample size and effect size, and the extreme effect size heterogeneity found could in principle be a result of publication bias" (Bösch et al., 2006:497). BSB's allegation of publication bias warrants no elaborate comments. Every scientist knows that it is difficult to publish nonsignificant results. This is true not only for parapsychological research, which addresses the problem candidly, as BSB well know (Bösch et al., 2006:515). Furthermore, from a statistical viewpoint, it is not a priori permissible to call a negative z-value "significant," as BSB did. To make a decision about the significance of a probable effect, BSB would have had to discuss all studies from the viewpoint of whether the studies were performed under a one-tailed or two-tailed hypothesis. Under a one-tailed hypothesis, used for most studies that were done, a negative z-value is completely meaningless. But all positive results of previous meta-analyses in

Table 2 of the BSB-MA are marked as one-tailed! To describe the overall result of the BSB-MA as "significant" is yet another error of its authors.

The overall result of the BSB-MA raises the question why, contrary to the three former meta-analyses, a total negative score of $z = -3.67$ was reported. The answer is obvious. The 2004 PEAR report by Dobyns et al., included in the BSB-MA, contains three studies with a total of more than 3×10^{11} trials, a number that is about 100 times higher than the approximately 10^9 trials of all other studies analyzed in the BSB-MA. These three studies showed negative deviations from chance expectation ("MegaREG fast REG" $z = -2.98$, "fast REG" $z = -2.43$, "Mega-Mega-REG, fast modus" $z = -2.08$). Dobyns et al. commented on these studies:

> In the initial phase of MegaREG, the 200-bit trials produced outcomes comparable with our standard experiments, while the 2-million-bit trials produced an effect somewhat larger in absolute scale, but inverted with regard to intention. [...] A related experiment called "MegaMega" [...] produced a reversed intentional effect of the same scale. (Dobyns et al., 2004:369)

BSB knew about that problem, as they wrote themselves: "Without these three studies, both models showed a statistically highly significant effect in the intended direction." (Bösch et al., 2006:506) It is not known which changes had been made to the hardware and/or software of the PEAR RNG to achieve a 10^4 times higher RNG output rate. In all former PEAR experiments, the RNG output was 200 bits per trial. In the new "high speed experiments", there were 2,000,000 bits per trial. No control data for these exceptional studies were included in the BSB-MA. That is regrettable, because Dobyns et al. stated in their 2004 paper (Dobyns et al., 2004:393) that "The noise source used has since suffered electronics failure."

We can conclude, therefore, that the overall negative result of the BSB-MA ($z = -3.67$) could be due to a large amount of data from an RNG that may have been malfunctioning. Since BSB decided to use this material and to value it higher than all other studies together, they could just as well have decided to leave out all other studies. They would have come up with the same overall result. Excluding the 2004 Dobyns et al. study, the z-score of the BSB-MA would be +3.59.

Trying to find an explanation for their results, BSB claimed:

> However, another difference between the current and the previous meta-analyses lies in the application of inclusion and exclusion criteria. We focused exclusively on studies examining the alleged concurrent interaction between direct human intention and RNGs. All previous meta-analyses also included nonintentional and nonhuman studies. [...] This difference might explain the reduction in effect size and significance level. (Bösch et al., 2006:513f)

But this statement is not correct. BSB arbitrarily excluded genuine "intentional" PK studies and included "nonintentional" ESP studies (such as mine). This might explain a z-score of +3.59 (excluding the 2004 Dobyns et al. data), which is much lower than in the previous three PK meta-analyses.

This article will have served its purpose if it facilitates an assessment of the factors that contributed to the publication of faulty data and conclusions in an important field of parapsychological research.

Notes

[1] The results of all retro PK experiments were excluded from the BSB-MA.

[2] This problem was addressed earlier by the author (Kugel et al., 1978), including a new definition of Psi.

[3] Despite the fact that I contacted the authors Dean Radin and Roger Nelson several times, I was not given access to the complete original databases of the meta-analyses they published in 1989, 1997, and 2003.

[4] The studies A and B were performed with a toy roulette (A) and at real roulette tables at the Casino in the Berlin "Europa Center" (B). BSB write (Bösch et al., 2006:498): "Although there has been some variety in methods to address PK, such as coin tossing and influencing the outcome of a roulette wheel, these methods have been used only occasionally." This statement is not correct. I am not aware of one single experiment testing possible influences of intent on the outcome of a real roulette wheel. All experiments with real roulette wheels were precognition experiments.

References

Beloff, J., & Evans, L. (1961). A radioactivity test of psycho-kinesis. *Journal of the Society for Psychical Research, 41,* 41–46.

Bierman, D. (1985). A retro and direct PK test for babies with the manipulation of feedback: A first trial of independent replication using software exchange. *European Journal of Parapsychology, 5,* 373–390.

Boller, E. (2007). Erwiderung auf die kommentare von Suitbert Ertel und Ulrich Timm zur RNG-metaanalyse von Bösch, Steinkamp & Boller (2006). http://www.anomalistik.de/sdm_pdfs/erwiderung_boller_auf_timm_ertel.pdf

Bösch, H., Steinkamp, F., & Boller, E. (2006). Examining psychokinesis: The interaction of human intention with random number generators—A meta-analysis. *Psychological Bulletin, 132*(4), 497–523.

Bösch, H., Steinkamp, F., & Boller, E. (2006a). In the eye of the beholder: Reply to Wilson and Shadish (2006) and Radin, Nelson, Dobyns, and Hooutkooper (2006). *Psychological Bulletin, 132*(4), 533–537.

Dobyns, Y., Dunne, B., Jahn, R., & Nelson, R. (2004). The MegaREG Experiment: Replication and interpretation. *Journal of Scientific Exploration, 18*(3), 369–397.

Ertel, S. (2006). Kritischer kommentar zu einer meta-analyse von Bösch, Steinkamp & Boller. *Workshop der WGFP, Offenburg, 5*. November. (http://www.anomalistik.de/sdm_pdfs/ertel-boesch-kritik.pdf)

Jahn, R., Dunne, B., Nelson, R., Dobyns, Y., & Bradish, G. J. (1997). Correlations of random binary sequences with pre-stated operator intention: A review of a 12-year program. *Journal of Scientific Exploration, 11*(3), 345–367.

Jahn, R., Dunne, B., Bradish, G., Dobyns, Y., Lettieri, A., Nelson, R., Mischo, J., Boller, E., Bösch, H., Vaitl, D., Houtkooper, J., & Walter, B. (2000). Mind/Machine Interaction Consortium:

PortREG replication experiments. *Journal of Scientific Exploration, 14*(4), 499–555.
Kugel, W. (1992). Amplifying precognition: Two experiments with roulette. *European Journal of Parapsychology, 8*(1990–1991), Edinburgh 1992, 85–97.
Kugel, W. (1999). Amplifying precognition: Four experiments with roulette. *The Parapsychological Association 42nd Annual Convention: Proceedings of Presented Papers*; August 4–8, 1999, Stanford University, Palo Alto, California, pp. 136–146. Durham, NC: Parapsychological Association.
Kugel, W. (2000). Abschlußbericht. *Projektnummer 670110*, Juli 2000. Freie Universität Berlin, Fachbereich Physik, Gast-Forschungsprojekt "Prognostizierbarkeit stochastischer Ereignisse (Präkognition / Psychokinese)".
Kugel, W., Bauer, B., & Bock, W. (1979). Versuchsreihe TELBIN [Experimental series TELBIN]. *Arbeitsbericht 7* [*Research Report No. 7*], Forschungsprojekt-Schwerpunkt Biokommunikation, Fachbereich Informatik, Technische Universität Berlin (Germany).
Kugel, W., Bock, W., Bauer, B., & Pörner, B. (1978). *Materialsammlung Psychotronik/ Parapsychologie.* Berlin: Forschungsinstitut für Psychotronik.
May, E. C., Radin, D. I., Hubbard, G. S., Humphrey, B. S., & Utts, J. M. (1985). Psi experiments with random number generators: An informational model. *The Parapsychological Association 28th Annual Convention: Proceedings of Presented Papers*, pp. 235–266. Durham, NC: Parapsychological Association.
May, E. C., Utts, J., & Spottiswoode, J. P. (1995a). Decision augmentation theory: Toward a model of anomalous mental phenomena. *Journal of Parapsychology, 59,* 195–220.
May, E. C., Utts, J., & Spottiswoode, J. P. (1995b). Decision augmentation theory: Applications to the random number generator database. *Journal of Scientific Exploration, 9*(4), 453–488.
May, E. C., Utts, J., Spottiswoode, J. P., & James, C. L. (1995c). Applications of decision augmentation Theory. *Journal of Parapsychology, 59,* 221–250.
Morris, R. (1982). Assessing experimental support for true precognition. *Journal of Parapsychology, 46,* 321–336.
Nelson, R., Dobyns, Y., Dunne, B., Jahn, R. (1991). Analysis of variance of REG experiments: Operator intention, secondary parameters, database structure. *Technical Note PEAR 91004*. Princeton, NJ: Princeton Engineering Anomalies Research Laboratory.
Nelson, R. (1994). Effect size per hour: A natural unit for interpreting anomalies experiments. *Technical Note 94003.* Princeton, NJ: Princeton Engineering Anomalies Research Laboratory.
Radin, D. (1982). Experimental attempts to influence pseudorandom number sequences. *Journal of the American Society for Psychical Research, 76,* 359–374.
Radin, D. (1997). *The Conscious Universe.* San Francisco: Harper Edge, pp. 138–144.
Radin, D., & Nelson, R. (1989). Evidence for consciousness-related anomalies in random physical systems. *Foundations of Physics, 19*(12) (December 1989), 1499–1514.
Radin, D., & Nelson, R. (2003). Research on mind–matter interactions (MMI): Individual intention. In: W. B. Jonas & C. C. Crawford, (Eds.), *Healing, Intention and Energy Medicine: Research and Clinical Implications*, Edinburgh: Churchill Livingstone, pp. 39–48. Nearly identical Internet version *Meta-Analysis of Mind–Matter Interaction Experiments: 1959 to 2000* at http://www.boundarylab.org/bi/articles/rngma.pdf
Radin, D., Nelson, R., Dobyns, Y., & Houtkooper, J. (2006). Reexamining psychokinesis: Comment on Bösch, Steinkamp, and Boller. *Psychological Bulletin, 132*(4), 529–532.
Schmidt, H. (1970b). PK experiments with animals as subjects. *Journal of Parapsychology, 34,* 255–261.
Schmidt, H. (1976). PK effect on pre-recorded targets. *Journal for the American Society for Psychical Research, 70*(3), 267–291.
Schmidt, H. (1985). Addition effect for PK on pre-recorded targets. *Journal of Parapsychology, 49,* 229–244.
Tart, C. (1976). Effects of immediate feedback on ESP performance. In: J. D. Morris, W. G. Roll, & R. L. Morris (Eds.), *Research in Parapsychology 1975*, pp. 80–82. Metuchen, NJ: Scarecrow Press.
Timm, U. (2006). Kommentar zu Bösch, H., Steinkamp, F., & Boller, E.. *Workshop der WGFP, Offenburg, 4*. Novembre 2006. (http://www.anomalistik.de/sdm_pdfs/timm-boesch-kritik.pdf)
Varvoglis, M., & McCarthy, D. (1986). Conscious-purposive focus and PK: RNG activity in relation to awareness, task-orientation, and feedback. *Journal of the American Society for Psychical Research, 80,* 1–29.
Wilson, D., & Shadish, W. (2006). On blowing trumpets to the tulips: To prove or not to prove the null hypothesis—Comment on Bösch, Steinkamp, and Boller. *Psychological Bulletin, 132*(4), 524–528.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 63–75, 2011 0892-3310/11

RESEARCH

Karhunen–Loève Transform for Detecting Ionospheric Total Electron Content (TEC) Anomalies Prior to the 1999 Chi-Chi Earthquake, Taiwan

Jyh-Woei Lin

Kaohsiung Municipal Jhong-Jheng Industrial High School. No.80, Guanghua 2nd Rd., Qianzhen Dist., Kaohsiung City 806, Taiwan
pgjwl1966@gmail.com

Submitted June 1, 2010; Accepted January 5, 2011

Abstract—This research uses eigenvalue characteristics of the Karhunen–Loève Transform to investigate GPS network ionospheric total electron content (TEC) anomalies associated with Taiwan's Chi-Chi earthquake of September 21, 1999 (LT) (M_w = 7.6). The transforms are conducted for ionospheric TEC from August 1 to September 20, 1999 (local time), using data from 13 GPS receivers. The data were collected at 22°–26°N Lat. and 120°–122°E Long. Applying the Karhunen–Loève Transform to the GPS receiver data TEC anomalies gave large principal eigenvalues (>0.5 in a normalized set) on August 14 and September 17, 18, and 20, with allowance given for the Dst index, which was quiet for the study period. Comparisons were then made with other researchers who also found TEC anomalies on September 17, 18, and 19 associated with the Chi-Chi earthquake. Consideration is also given to reported ground-level geomagnetic field activity that occurred between mid-August and late October leading up to and including the Chi-Chi and Chia-Yi earthquakes, which are associated with the same series of faults. It is possible that August 14 is representative of an earthquake-associated TEC anomaly. This is an interesting result given how much earlier than the earthquake it occurred.

Keywords: Karhunen–Loève Transform—GPS network ionospheric total electron content (TEC)—Taiwan's Chi-Chi Earthquake

Introduction

In recent years, ionospheric total electron content (TEC) anomalies and their potential association with earthquakes have led some researchers to think that such anomalies could be used in earthquake prediction (Hsiao et al., 2010, Pulinets, 2004, Hayakawa, 2007, Heki et al., 2006, Liperovskaya et al., 2006, Liu et al., 2006, Liu & Gao, 2004, Hegai et al., 2006). This is partly because examination of solid-earth and ionospheric coupling has been greatly improved

by GPS satellite coverage whereby TEC anomalies are detectable due to signal delay between ground-based receivers and GPS satellites.

The specific causes of TEC anomalies are not yet known; however, during earthquake preparation, there are many processes that could create TEC depletions and enhancements. The possibilities include: radon ionization producing strong electric fields in the lower atmosphere (Pulinets & Boyarchuk, 2004); local electric fields caused by charge separation in stressed rock whereby positive holes (pholes) flow out of the stressed rock portion to areas of less stress causing charge separation. These pholes can travel long distances from the earthquake-preparation zone deep in the crust to the earth's surface. They concentrate at the ground-to-air interface creating electric field ionization of air molecules (Freund et al., 2009). The turbulence from rapid CO_2 gas release might also create lower-atmosphere electric fields (Voitov & Dobrovolsky 1994). Such lower-atmosphere electric fields could travel along geomagnetic field lines into the ionosphere. A final coseismic aspect that has been closely examined are fine vibrations in the earth's surface creating sub-audible pressure waves that are amplified by density contrast in the atmosphere to produce large amplitude pressure waves which are called "atmospheric gravity waves" in the ionosphere (Garcia et al., 2005).

Other related studies include research into changes in the geomagnetic field in the preparation zone of earthquakes. For example, prior to the M = 7.3 September 21, 1999, Chi-Chi earthquake until after the M = 6.2 October 22, 1999, Chia-Yi earthquake on Taiwan anomalous amplitudes in geomagnetic intensity as high as 200 nTs existed for six weeks leading up to the Chi-Chi earthquake and lasting until after the Chia-Yi earthquake sequence (Yen et al., 2004). The Chi-Chi earthquake occurred due to bedding slip along the Chelungpu fault, and the Chia-Yi earthquake occurred just south of this fault on the Meishan fault, considered the southern boundary of the Chi-Chi earthquake (Yue et al., 2005). Yen et al. (2004) consider the possibility of changes in the geomagnetic field being related to crustal stress during these earthquakes and cite earlier work by Freund (2000) and Bolt (1999) on rapidly moving streaming potentials (mentioned in the above paragraph) and electrical charge transfers due to changes in electrical and hydraulic connectivity patterns by Lorne et al. (1999).

Researching the association between solid-earth and ionospheric TEC anomalies is difficult due to the ionosphere being plasma-like and influenced by many variables requiring reliable earth and sun models. Currently, we do not have enough dependable information to make such models; however, statistical models of real TEC have in the past been able to show association between earthquakes and TEC anomalies. Pulinets et al. (2004) showed that by using the daily cross-correlation coefficient for ionospheric TEC between

two ionosondes (one covering the epicenter of the earthquake and the other hundreds of km away) it was possible to identify statistically TEC anomalies occurring up to seven days before mainshock nucleation. Liu and Gao (2004) used a 15-day running median of TEC and the associated interquartile range applied to ground-based GPS-receiver data to measure ionospheric TEC anomalies for 20 ($M \geq 6$) earthquakes (September 1999 to December 2002) on Taiwan. In their study, TEC anomalies occurred in 80% of cases and were prevalent within five days prior to the mainshock. Pulinets et al.'s (2004) use of ionosondes was based on the cross-correlation coefficient for TEC anomalies between two ionosondes being high (~0.9). This is significant because the impact of geomagnetic activity on TEC could be measured simultaneously at both ionosondes, meaning a sharp drop in the correlation would be indicative of a localized TEC anomaly furthering the case for earthquake association. Liu and Gao (2004) established earthquake association for TEC anomalies by using statistical analysis. First, they showed that sparse TEC anomalies occurred on 25% of the days in the study period, giving a 1 in 4 chance of observing a sparse TEC anomaly on any given day. However, their data showed that the chance of an anomaly occurring in the five days before a major earthquake was 44%, which was almost twice the rate for any other 5-day period (23%).

The use of ionosondes to measure TEC is well-established; however, spatial and temporal coverage is limited, making earthquake-related TEC anomaly correlations difficult (Liu & Gao, 2004). Plus TEC maps generated from ionosondes are subject to short-wave fadeout leading to data gaps (Davies, 1990, Liu & Gao, 2004). On the other hand, the number of ground-based GPS receivers is large and growing, giving good coverage, except over oceans.

One inherent weakness of the statistical methods used above is that they rely on a definition of what constitutes normal TEC levels to find anomalies. Defining normal TEC levels is difficult because TEC by nature is not stable in space and time. This means that any theory which relies solely on identifying TEC anomalies as deviations from a statistical average is not immediately apparent even if true. Another issue is that in the case of Pulinets' research the registration of a TEC anomaly depends on the use of ionosondes to determine a localized anomaly through earthquake-associated TEC anomalies that could occur away from the epicenter (Pulinets et al., 2002). Also, ionosonde coverage is not always adequate, and computation of anomalies might require daily records, limiting real-time computation capacity.

To help overcome these issues, in a previous paper (Lin, 2010) I examined the validity of using the Karhunen–Loève Transform (KLT) applied to one-dimensional TEC data gathered near the epicenters of 12 ($M \geq 5.0$) earthquakes that occurred on Taiwan between January 2002 and December 2003. These earthquakes were previously confirmed statistically by Liu et al. (2006) to

have earthquake-related anomalies. The results of Lin (2010) confirmed the findings of Liu et al. (2006) that TEC anomalies existed on the days they claimed; however, unlike the "running median" method used in Liu et al. (2006), the KLT method determines the existence of TEC anomalies on the basis of a mathematical index. The KLT method was able to give independent confirmation of Liu et al.'s results. Like the "running median" method applied by Liu et al. (2006) and others, KLT still requires elimination of other potential causes such as solar flare and geomagnetic storm activity. However, Lin (2010) showed that the technique is independent of long-term variance in TEC due to internal ionospheric features. Lin (2010) helped establish criteria for using KLT to discover earthquake-related TEC anomalies. The criteria established allows KLT to detect earthquake-associated TEC anomalies when earthquakes are larger than $M \geq 5.0$, detection is within the earthquake preparation zone, and no alternative explanation such as X-ray flux or geomagnetic activity is available to explain the TEC anomalies. This paper gives consideration to the research of Yen et al. (2004), who measured geomagnetic field anomalies between August and October 1999 close to the Chi-Chi and Chia-Yi earthquakes and research by Liu et al. (2001) who found statistically relevant TEC anomalies on September 17, 19, and 20, 1999, pertaining to the Chi-Chi earthquake.

The Karhunen–Loève Transform is applied to local GPS network (Figure 1) ionospheric TEC records from August 1 to September 20 (local time) before the M = 7.6 Chi-Chi earthquake of September 2 , 1999 (01:47:159 local time), 23.85°N and 120.78°E at a depth of ~8 km. Data are based on GPS network data collected from 13 GPS receivers (15-min intervals) at 22°–26°N Lat. and 120°–122°E Long. (Figure 1). The results of the transforms are then compared with those of Liu et al. (2001) and the geomagnetic field disturbance that occurred at the earth's surface attributed to the Chi–Chi earthquake by Yen et al. (2004).

The Karhunen–Loève Transform and TEC Data Processing

The Karhunen–Loève Transform

The KLT method is a widely used technique in data analysis. It is a simple non-parametric method that allows the extraction of relevant data from confusing datasets. The technique makes three basic assumptions: linearity, a high signal to noise ratio (SNR), and orthogonal principal components. Linearity allows for the problem to be framed as a change of basis, a high SNR means that principal components with larger variance represent points of interest and those with lower variance represent noise (this assumption is strong and can be incorrect), and orthogonality makes KLT solvable with linear algebra. In general terms, KLT allows for the underlying structure to be seen if the initial assumptions are correct.

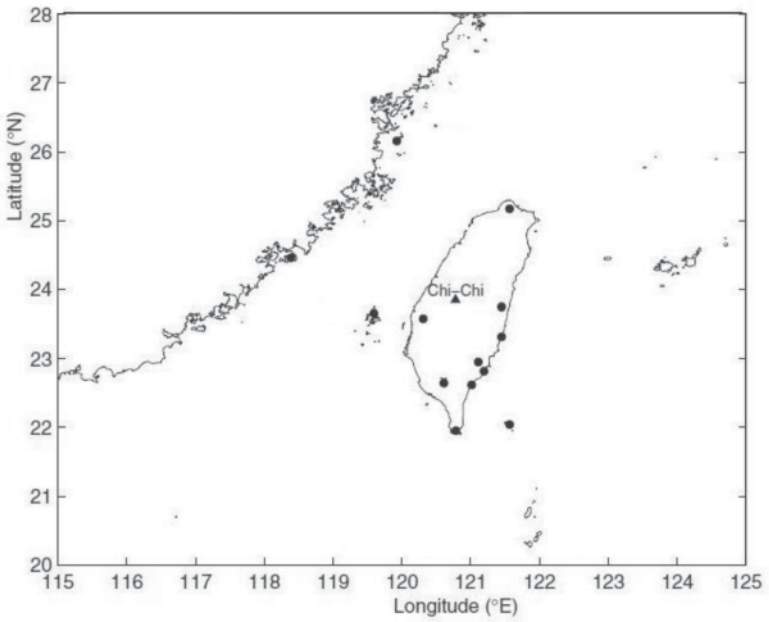


Figure 1. This figure shows the location of 13 GPS receivers (filled circles), and the epicenter of the Chi-Chi earthquake (triangle).

Essentially, the method is a variable reduction method. In the case of TEC anomalies, the TEC data are reduced to see if there are any discernable patterns among the data that could be related to the same construct (earthquake preparation). This is done by reducing the observed variance in TEC to a smaller number of artificial variables called principal components represented by principal eigenvalues. The maximum principal eigenvalue gives the principal characteristics of the signals. An explanation of data and data processing is given in the next section. The transform matrix is given in Equation (1) below. The input TEC Signals X form a matrix A with m rows and n columns:

$$A = [X]_{m \times n} \tag{1}$$

For each n, u is a unit vector. If we let $AA^T u = \lambda u$, then the eigenvalues are $\lambda_1 \geq \lambda_2 \geq .... \geq \lambda_m$ (output data). The maximum eigenvalue (principal eigenvalue) λ_1 represents the principal characteristics of signals.

TEC Record Processing Using Karhunen–Loève Transform

The Karhunen–Loève Transform is applied to data from August 1 to September 20, 1999. The daily data were collected from 13 GPS receivers (15-min intervals) at 22°–26°N Lat. and 120°–122°E Long. (Figure 1). The 15-minute intervals mentioned suggest that the GPS data were obtained from certain GPS satellites that appear over the horizon every 15 minutes. The Chi-Chi earthquake (M_w = 7.6) occurred at 01:47:159 (LT) on September 21, 1999, at 23.85°N and 120.78°E at a depth of ~8 km. For TEC characteristics to be described on a day-to-day basis, the TEC records for a day form matrices of dimensions 13 rows (receivers) (m) and 96 columns (a day) (n), and these are used as inputs to Equation (1) to output a principal eigenvalue for this day.

The principal eigenvalues generated are representative of daily TEC. Figure 2 shows the principal eigenvalues from August 1 to September 20 for the TEC records that are mentioned above. All of the principal eigenvalues are normalized by dividing by the maximal value. Principal eigenvalues are considered large when they are >0.5 in a normalized set (Lin, 2010). The magnitudes of principal eigenvalues are large on August 14 and September 17, 18, and 20.

Results and Discussion

Figure 2 gives the results of the KLT conducted for August 1 to September 20, 1999. Four large principal eigenvalues are found for the time period August 14, and September 17, 18, and 20. Figure 3a–d shows the latitude–time–TEC plots obtained from the Taiwan GPS network (Liu et al., 2001) on August 14 and September 17, 18, 20, before the Chi-Chi earthquake. Figure 3e is a normal day. Note depletions are evident at the approximate latitude of the Chi-Chi earthquake according to Figure 3a–d. The results for September 17, 18, and 20 are similar to those of Liu et al. (2001) who also found TEC anomalies for these dates. In that study, Liu et al. combined data from 13 GPS receiver stations with time and spatial variations in TEC prior to the Chi-Chi earthquake and found statistically significant decreases in TEC one, three, and four days before the earthquake based on a 15-day running median for TEC. Taiwan lies under the northern boundary of the equatorial ionospheric anomaly (EIA), and Liu et al.'s paper describes an equatorialward shift of the EIA for the afternoon periods of September 17, 18, and 20. Similarly, Tsai et al. (2006) utilizing a 15-day median and the assumption of a normal distribution found with an 80 to 85% confidence level TEC anomalies on September 17 and 18 for the time period 10:00 to 20:00 (LT). In a later study, Nishihashi et al. (2009) examining the spatial extent of GPS–TEC related TEC anomalies found that it was possible the September 17 anomaly could have been influenced by geomagnetic storm activity; however,

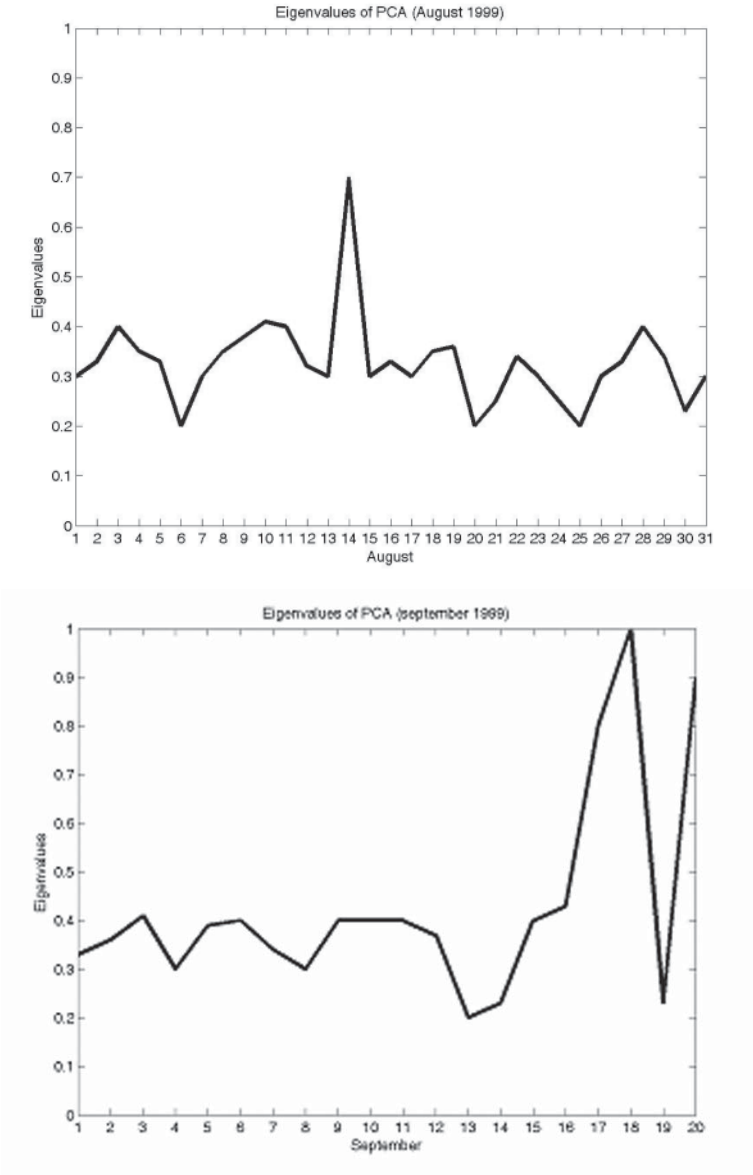
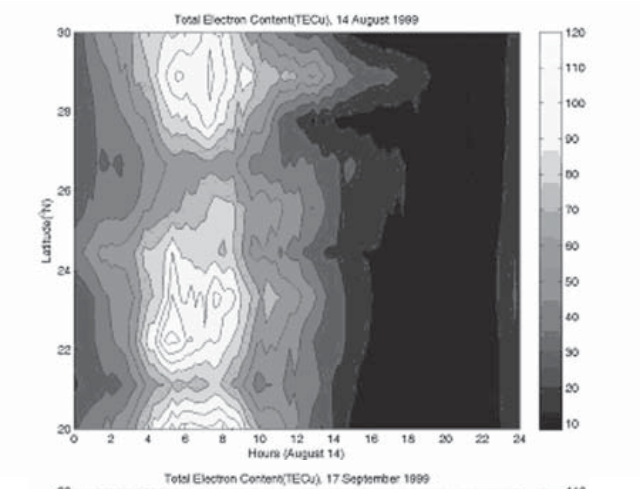
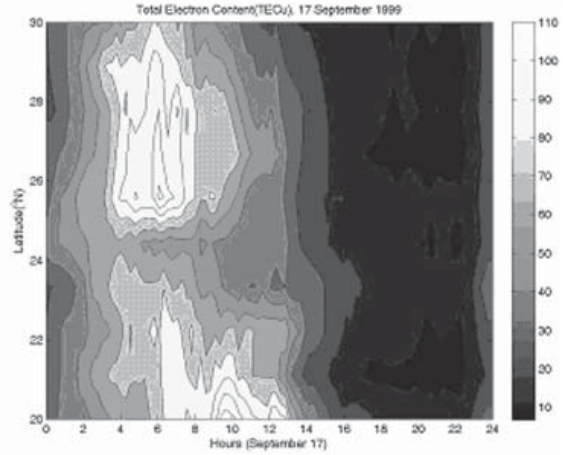


Figure 2. This figure shows eigenvalues assigned to ionospheric TEC from August 1 to September 20, 1999. Dates constitute the horizontal axis, and corresponding eigenvalues are on the vertical axis. Peaks and troughs in eigenvalues have been plotted and graphed on a day-to-day basis to allow for interpolation.

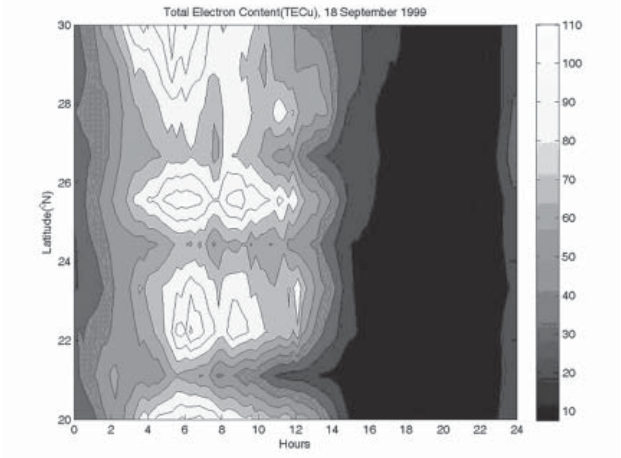
(a)


Total Electron Content(TECu), 14 August 1999
Latitude(°N)
Hours (August 14)

(b)


Total Electron Content(TECu), 17 September 1999
Latitude(°N)
Hours (September 17)

(c)


Total Electron Content(TECu), 18 September 1999
Latitude(°N)
Hours

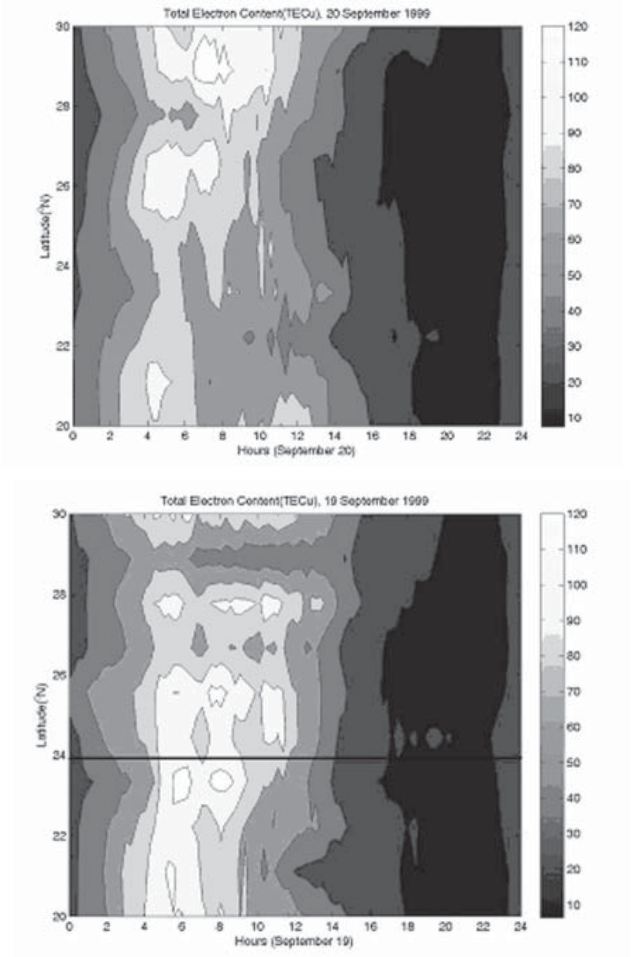


Figure 3. The latitude–time–TEC plots obtained from the Taiwan GPS network on August 14, and September 17, 18, 20, before the Chi-Chi earthquake. (e) is a normal day. The line shows the latitude of the Chi-Chi earthquake.
(a) August 14, 1999.
(b) September 17, 1999.
(c) September 18, 1999.
(d) September 20, 1999.
(e) September 19, 1999.

the study confirmed September 18 and 20 as potentially earthquake-related TEC anomaly days.

As mentioned in the Introduction, Yen et al. (2004) measured geomagnetic activity associated with the 1999 Chi-Chi and Chia-Yi earthquakes. These two earthquakes are closely related to a series of faults that include the Chelungpu, Tachiashan, Meishan, Luliao, and Chushiang faults, all of which are thought to have been active during the Chi-Chi and Chia-Yi earthquake sequence. Geomagnetic fluctuations for southern Taiwan were measured by a series of 7 magnetometers distributed across seismic zones throughout southern and eastern Taiwan with an additional reference station in seismically quiet northern Taiwan. The study conducted from mid-August to November 1999 found frequent fluctuations in geomagnetic intensity caused by earthquake preparation processes for six weeks leading up to the Chi-Chi earthquake until right after the October 22 Chia-Yi earthquake, after which time geomagnetic activity became quiet very abruptly (figure 2 in Yen et al. 2004). The causes of geomagnetic fluctuations are not completely understood.

Yen et al. (2004) consider the possibility of intense electric fields created by charge separation developing in stressed rocks when pholes move away from the stressed rock areas (Freund, 2000) as described in the Introduction and also streaming potentials caused by changes in the hydraulics of crustal rocks and sediments (Lorne et al., 1999). Considering these results in association with those given in Figure 2 for the KLT, a large principal eigenvalue was found on August 14 and for the days close to the Chi-Chi earthquake. August 14 is earlier than the collection date for geomagnetic activity given by Yen et al. (2004). While their paper and a consequent paper by Tsai et al. (2006) do not mention why mid-August was chosen as the commencement date for observing geomagnetic activity associated with these two earthquakes, one can assume this is probably because that is when they first noted anomalous activity. This would mean the August 14 anomaly perhaps occurred when earthquake-related geomagnetic activity was in a quiet period. However, that would need to be confirmed.

The August 14 result, however, is interesting in another way. It occurred well before the Chi-Chi earthquake on a geomagnetic quiet day according to the Dst. Index (Figure 4). The result is similar for that of September 17, 18, and 20 (also quiet days by the Dst Index), where KLT confirmed the results of TEC anomalies associated with the Chi-Chi earthquake by Liu et al. (2001), Tsai et al. (2006), and Nishihashi et al. (2009). It is possible that the TEC anomaly of Aug. 14 is earthquake-related, and it occurred well before the dates discovered above by these other researchers, all of whom used 15-day running medians before the Chi-Chi earthquake. The reason this is done is because past research by Chen et al. (2004) showed that the observation of earthquake-associated

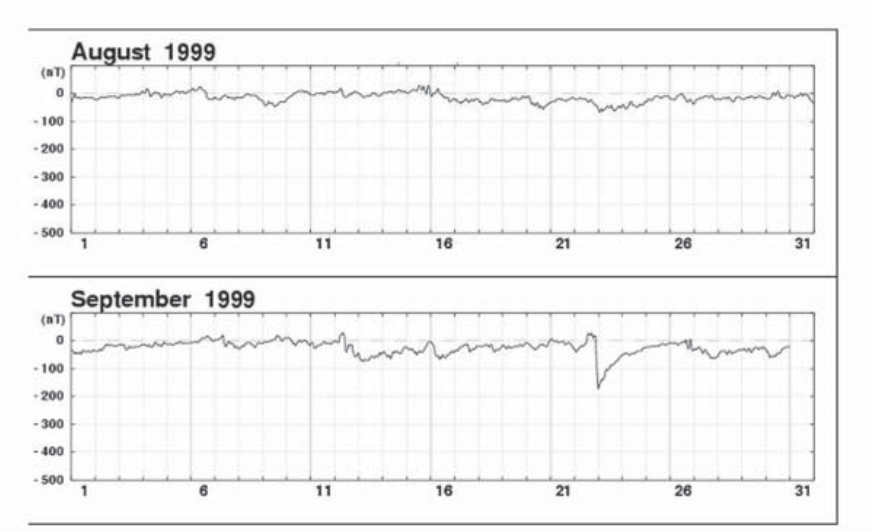


Figure 4. Dst index from August 1, 1999 to September 30, 1999.

TEC anomalies in Taiwan for M ≥ 5 earthquakes in the 1 to 5 days before an earthquake (1994 to 1999) was not due to statistical chance. This they proved with a simple coin-toss comparative study. However, if KLT has the ability to determine earthquake-associated anomalies based on a firmer mathematical footing than statistical association (deviations from a running median), then August 14 could possibly be an earthquake-associated anomaly.

Two recent studies of the China, May, 12, 2008, Wenchuan earthquake (Kakinami et al., 2010, Jhuang et al., 2010) using empirical studies with normalized TEC data found possible earthquake-related TEC anomalies on days 6 and 13 before that earthquake. Their results are important in that they help support the result given in this work.

Conclusion

The Karhunen–Loève Transform (KLT) is applied to data from 13 GPS receivers to detect earthquake-associated TEC anomalies related to Taiwan's Chi-Chi earthquake of September 21, 1999 (LT) (M_w = 7.6). The transforms are conducted for ionospheric TEC from August 1 to September 30, 1999 (local time). Data collection was for the region 22°–26°N Lat. and 120°–122°E Long. TEC anomalies were given by large principal eigenvalues (>0.5 in a normalized set) for September 17, 18, and 20, and August 14 with consideration given

for the Dst. Index, which was quiet for the study period. Comparisons are made with the work of other researchers such as Liu et al. (2001) who also identified TEC anomalies for these days through deviations from a 15-day running median and Yen et al. (2004) who reported intense geomagnetic field activity at a ground level leading up to the Chi-Chi earthquake until after the October 22, 1999, Chia-Yi earthquake. Both these earthquakes are associated with the same series of faults. The comparative results for KLT with ground-level geomagnetic activity are inconclusive. The possibility, however, exists that August 14 had an earthquake-associated TEC anomaly earlier than the 1-to-5–day period currently used to find these anomalies.

Acknowledgments

The author is grateful to: Dr. J. Y. Liu of the Institute of Space Science, Dr. Louis (L.Y.) Tsai of the Graduate Institute of Applied Geology, and Dr. H. W. Chen of the Institute of Geophysics, National Central University, for their useful references and data support. Special gratitude is extended to the author's German professors, Dr. Jürgen Fertig and Andreas Weller of the Institute of Geophysics, Technische Universität Clausthal, for my training in Germany. The author also thanks Dan Flynn of www.planetediting.com for English editing and writing of the paper.

References

Bolt, B. A. (1999). *Earthquake, Fourth Edition*. New York: W. H. Freeman and Company.

Chen, Y. I., Liu, J. Y., Tsai, Y.-B., & Chen, C. S. (2004). Statistical tests for pre-earthquake ionospheric anomaly. *TAO, 15*(3), 385–396.

Davies, K. (1990). *Ionospheric Radio.* London: Peter Peregrinus. 580 pp.

Freund, F. (2000). Time-resolved study of charge generation and propagation in igneous rocks. *Journal of Geophysical Research, 105,* 11001–11019.

Freund, F. T., Kulahci Ipek, G., Cyr, G., Ling, J., Winnick, M., Tregloan-Reed, J., & Freund, M. (2009). Air ionization at rock surfaces and pre-earthquake signals. *J. Atmos. Sol. Terr. Phys., 71,* 1824–1834.

Garcia, R., Crespon, F., Ducic, V., & Lognonné, P. (2005). Three-dimensional ionospheric tomography of post-seismic perturbations produced by the Denali earthquake from GPS data. *Geophys. J. Int., 163,* 1049–1064.

Hayakawa, M. (2007). VLF/LF Radio sounding of ionospheric perturbations associated with earthquakes. *Sensors, 7*(7), 1141–1158.

Hegai, V. V., Kim, V. P., & Liu, J. Y. (2006). The ionospheric effect of atmospheric gravity waves excited prior to strong earthquake. *Advance in Space Research, 37,* 653–659.

Heki, K., Otsuka, Y., Choosakul, N., & Hemmakokom, N. (2006). Detection of ruptures of Andaman Fault segments in the 2004 great Sumatra earthquake with coseismic ionospheric disturbances. *Journal of Geophysical Research, 111,* B09313. doi: 10.1029/2005JB004202

Hsiao, C. C., Liu, J. Y., Oyama, K. I., Yen, N. L., Liou, Y. A., Chen, S. S., & Miau, J. J. (2010). Seismo-ionospheric precursor of the 2008 Mw7.9 Wenchuan earthquake observed by FORMOSAT-3/COSMIC. *GPS Solutions, 14*(1), 83–89. doi: 10.1007/s10291-009-0129-0

Jhuang, H. K., Ho, Y. Y., Kakinami, Y., Liu, J. Y., Oyama, K. I., Parrot, M., Hattori, K., Nishihashi, M., & Zhang, D. (2010). Seismo-ionospheric anomalies of the GPS-TEC appear before the 12 May 2008 magnitude 8.0 Wenchuan Earthquake. *Int. J. Remote Sens., 31*(13), 3579–3587.

Kakinami, Y., Liu, J. Y., Tsai, L. C., & Oyama, K. I. (2010). Ionospheric electron content anomalies detected by a FORMOSAT-3/COSMIC empirical model before and after the Wenchuan Earthquake. *Int. J. Remote Sens., 31*(13), 3571–3578.

Lin, J. W. (2010). Ionospheric total electron content (TEC) anomalies associated with earthquakes through Karhunen-Loéve Transform (KLT). *Terr. Atmos. Ocean. Sci., 21*(2), 253–265.

Liperovskaya, E. V., Meister, C. V., Parrot, M., Bogdanov, V. V., & Vasil'eva, N. E. (2006). On Es-spread effects in the ionosphere connected to earthquakes. Natural Hazard and Earth System Sciences (2006) 0000:0001-3. *TAO, 7*(1), 107–117.

Liu, J. Y., Chen, Y. I., Chuo, Y. J., & Tsai, H. F. (2001). Variations of ionospheric total electron content during the Chi-Chi earthquake. *Geophysical Research Letters, 28*(7), 1383–1386.

Liu, Z., & Gao, Y. (2004). Ionospheric TEC predictions over a local area GPS reference network. *GPS Solutions, 8*(1), 23–29.

Liu, J. Y., Chen, Y. I., Chuo, Y. J., & Chen, C. S. (2006). A statistical investigation of pre-earthquake ionospheric anomaly. *Journal of Geophysical Res., 111,* A05304, 10.1029/ 2005JA011333.

Lorne, B., Perrier, F., & Avouac, J. P. (1999). Streaming potential measurements 2. Relationship between electrical and hydraulic flow patterns from rock samples during deformation. *J. Geophys. Res., 104,* 17879–17896.

Nishihashi, M., Hattori, K., Jhuang, H. K., & Liu, J. Y. (2009). Possible spatial extent of ionospheric GPS-TEC and NmF2 anomalies related to the 1999 Chi-Chi and Chia-Yi earthquakes in Taiwan. *Terr. Atmos. Ocean. Sci., 20*(6), 779–789.

Pulinets, S. A., Boyarchuk, K. A., Lomonosov, A. M., Khegai, V. V., & Liu, J. Y. (2002). Ionospheric precursors to earthquake: A preliminary analysis of the foF2 critical frequencies at Chung-Li Ground-Based Station for Vertical Sounding of the Ionosphere (Taiwan Island). *Geomagnetism and Aeronomy, 42,* (3), 508–513.

Pulinets, S. A. (2004). Ionospheric precursors of earthquakes; Recent advances in theory and practical applications. *TAO, 15*(3), 413–435.

Pulinets, S., & Boyarchuk, K. (2004). *Ionospheric Precursors of Earthquakes.* Berlin/Heidelberg: Springer-Verlag.

Pulinets, S. A., Gaivoronska, T. B., Leyva Contreras, A., & Ciraolo, L. (2004). Correlation analysis technique revealing ionospheric precursors of earthquakes. *Natural Hazard and Earth System Sciences, 4,* 697–702.

Tsai, Y. B., Liu, J. Y., Ma, K. F., Yen, Y. H., Chen, K. S., Chen, Y. I., & Lee, C. P. (2006). Precursory phenomena associated with 1999 Chi-Chi earthquake in Taiwan as identified under the iSTEP program. *Phys. Chem. Earth, 31,* 365–377.

Voitov, G. I., & Dobrovolsky, I. P. (1994). Chemical and isotopic-carbon instabilities of the native gas flows in seismically active regions. *Izvestiya Earth Science, 3,* 20–31.

Yen, H. Y., Chen, C. H., Yeh, Y. H., Liu, J. Y., Lin, C. R., & Tsai, Y. B. (2004). Geomagnetic fluctuations during the 1999 Chi-Chi earthquake in Taiwan. *Earth Planets Space, 56,* 39–45.

Yue, L. M., Suppe, J., & Hung, J. H. (2005). Structural geology of a classic thrust belt earthquake: The 1999 Chi-Chi earthquake Taiwan (M_w=7.6). *Jour. of Structural Geology, 27,* 2058–2083.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 77–101, 2011 0892-3310/11

HISTORICAL PERSPECTIVE

Eusapia Palladino: An Autobiographical Essay

Carlos S. Alvarado

Atlantic University, 215 67th Street, Virginia Beach, VA 23451
carlos.alvarado@atlanticuniv.edu

Abstract—This paper consists of commentaries about and the reprint of an autobiographical essay authored by Italian medium Eusapia Palladino (1854–1918) and published in 1910. The details of the essay are discussed in terms of the writings of other individuals about the life and performances of the medium. The essay conveys a view of Palladino as a person who suffered much in life and had a mission to help scientific research into mediumship. Typical of the positive emphasis in autobiographies in general, the medium did not discuss negative aspects of her performances. Due to the fact that the essay appeared during Palladino's visit to New York City in which many authors branded her as a fraud, it may be speculated that the purpose of this autobiography was to elicit sympathy from the American public. While some of the statements that Palladino made about phenomena are consistent with the statements of other authors who have written about her, there are several statements that show alternate or incomplete versions of particular events in her life. The differences suggest that Palladino's essay and other discussions about the medium's life are not reliable when it comes to specific details and to biographical accuracy.

Keywords: Eusapia Palladino—physical mediumship—history of psychical research—Cesare Lombroso—Enrico Morselli—Hereward Carrington

Introduction

The autobiographies of mediums, as seen in works such as those published by D. D. Home (1863) and Gladys Osborne Leonard (1931), provide us with useful biographical information. Furthermore, autobiography illuminates the strategies, as well as the realities and fictions with which these unique individuals choose to represent themselves. Even allowing for idealized or fictitious accounts, the way mediums depict themselves may provide us with much information about their goals and relationships, and their sense of mission, and as such are documents of importance to historians (e.g., Tromp, 2006). Furthermore, they may also reveal the human dimension of mediums, their fears, hopes, tribulations, and expectations. Keeping these issues in mind I present in

this paper a short autobiographical statement written by an important medium known for her production of physical effects, the Italian Eusapia Palladino (1854–1918).

The autobiographical essay appears below after some general information about research conducted with the medium and about her life. My intention is not to condemn nor to defend Palladino's behaviors. Neither am I concerned with evidential issues surrounding her mediumship. Instead I will discuss a little-known autobiographical essay to explore how Palladino presented herself. A secondary purpose of this paper is to provide information about the medium taken from generally neglected sources, such as French and Italian accounts of her mediumship.

Palladino and Psychical Research

Palladino is well-known to students of the history of psychical research. This is evident in studies of her mediumship (e.g., Alvarado, 1993, Blondel, 2002) and discussions in modern overviews of the history of psychical research (e.g., Beloff, 1993:114–120, Biondi, 1988:96–100,121–129,134–159, Gutierez & Maillard, 2004:82–100,117–138, Inglis, 1992, Chapters 35&38).[1] In addition to discussing the medium's phenomena and her interaction with researchers, previous authors have mentioned the many occasions on which she was caught in fraudulent activity (e.g., Carrington, 1909a:182, Courtier, 1908:521–540, Flammarion, 1907:520–521, Samona, 1910:287). Nonetheless, many of her investigators believed she could produce real phenomena.

Although there were earlier reports of her phenomena (e.g., Chiaia, 1890, Ciolfi, 1891), the first systematic scientific investigation of her mediumship was conducted in Milan in 1892 (Aksakof, Schiaparelli, du Prel, Brofferio, Gerosa, et al., 1893). Most of the seances took place in the presence of Imperial Councilor to the Czar Alexander Aksakof, philosophers Angelo Brofferio and Carl du Prel, physicists Giorgio Finzi, Giovanni Battista Ermacora, and

Giuseppe Gerosa, and astronomer Giovanni Schiaparelli. Physiologist Charles Richet and psychiatrist Cesare Lombroso also attended some of the seances.

Some of the best-known later investigations included those conducted in Cambridge (Sidgwick, 1895) and in Naples (Feilding, Baggally & Carrington, 1909) by representatives of the Society for Psychical Research, in Paris by the Institut Général Psychologique (Courtier, 1908), which included both Pierre and Marie Curie, and in New York by Hereward Carrington and others (Carrington, no date, Part 2, 1954). In addition, many other investigations of her phenomena were conducted over the years (e.g., Bottazzi, 1907, Lodge, 1894, Morselli, 1908, de Rochas, 1896, de Schrenck-Notzing, 1925).

Palladino produced a wide range of phenomena, which have been classified and listed by Italian psychiatrist Enrico Morselli (1907:342–359). He referred to subjective (mental) manifestations, such as high suggestibility, trances, divination of thought, and changes of personality in communications from her spirit control John King.[2] However, most of the classification consisted of objective or physical phenomena. Morselli mentioned movement of objects with and without contact with the medium (e.g., table movements), changes in the weight of objects (e.g., the weight of the medium), thermal manifestations (e.g., cold winds), sounds (e.g., blows and raps), effects on matter (e.g., imprints of limbs or faces on plaster), luminous phenomena (e.g., luminous points that seemed to be suspended in space), and invisible and visible materializations (e.g., hands felt or seen).[3]

To illustrate some phenomena reported with Palladino, we need to remember that the medium usually sat on a chair on one side of a table with her back to the cabinet, which consisted of a corner or a section of a room separated from the rest with a curtain. Small objects were placed on a table in the cabinet. In such a setting the following were commonly reported:

> The table on which the toys had been placed, and which we will call No. 1, made a noise in the interior of the cabinet, from which it at last came out completely. Then there began to arrive on the seance table many objects from table No. 1: a sheet of paper, a little wooden sheep, and a mandoline; the latter was accompanied by the curtain which covered the handle; the curtain, being pushed back by M. Foà, came back and covered the handle of the mandoline, and a hand, which was not that of the medium or of the sitters, pulled the hair of the person who had pushed back the curtain. At the same time we heard a scratching on the strings of the mandoline. (Aggazzotti, Foà, Foà, & Herlitzka, 1907:367–368)

Palladino's mediumship has traditionally been considered important for various reasons. Carrington argued in his book *Eusapia Palladino and Her Phenomena* (1909a:4) that her case was crucial for the defense of mediumistic physical phenomena. Years later Charles Richet addressed the same issue

when, writing in his influential *Traité de Métapsychique* (1922:38–39), he stated his belief that even if Palladino was the only medium in existence, her performances would have established the reality of telekinesis and materializations. Carrington (1909a) also stated: "No other medium, producing 'physical phenomena,' has been studied with so much care, for so long a period, and by so many scientific men, as she" (p. 1). This was not only important for the development of research techniques, but because Palladino's seances convinced many of these individuals—men such as Oliver Lodge, Cesare Lombroso, Enrico Morselli, Charles Richet, Albert F. von Schrenck-Notzing, and Julian Ochorowicz—of the reality of the phenomena. In addition, and as I have argued before (Alvarado, 1993), Palladino provided an opportunity in the form of phenomena, statements, and behaviors that assisted the creation of negative images of mediumship and the development of concepts of force in psychical research.[4]

Biographical Fragments

Palladino was born in Minervino Murge, in the province of Bari in southern Italy. Her birth certificate, published in the Italian magazine *Luce e Ombra*, shows that she was born on January 20, 1854 (Nota, 1918). Her name was Eusapia Maria, and her parents were Michele Palladino, a farmer, and Irene Barbiere. She was married twice, first in 1885 and later in 1907 (Nota, 1918). Asked by a lady years later why she chose her career as a medium, Palladino stated that hers was not a career. Rather it was her destiny (P. Lombroso, 1907:392).

Information about her life given by Palladino has appeared in many publications (e.g., P. Lombroso, 1907, Flammarion, 1907:67, C. Lombroso, 1909:39–40, Morselli, 1908, Vol. 1:117–124, de Rochas, 1896:13–22). They all refer to a child whose mother died giving her birth, and whose father was murdered by brigands, a child who lived with strangers at the time her mediumship was discovered. But we must remember, Massimo Biondi (1988:96) said in his history of Italian spiritism, that no one recorded the details of Palladino's early life at the time. Furthermore, Biondi has stated that the medium had the "curious vice of recounting the facts of her life in different ways to various persons that asked her about it" (pp. 96–97; this and other translations are mine). This is consistent with observations to the effect that Palladino contradicted herself frequently in her conversation (Morselli, 1908, Vol. 1:117). While there are some differences and omissions in the various accounts, they all mention the medium's hard early life separated from her family.

Palladino was said to belong to the "most humble class of society" (de Rochas, 1896:3). Others pointed out that she was illiterate (e.g., Flammarion,

1907:67). In his book *Psicologia e "Spiritismo,"* Morselli (1908) wrote that: "Her education has in fact always remained very low . . . she barely writes her own name, and is not able to talk in other languages but a mixed dialect of Apulian and Napolitan" (Vol. 1:124). He further argued that Palladino's talk was truncated, rarely presenting complete phrases (Vol. 1:117). However, in some accounts she was described as clever and highly perceptive of people's intentions (e.g., Courtier, 1908:180). In fact, Morselli (1908, Vol. 1:129–130) assured his readers that, contrary to some affirmations, the medium was not stupid. In his view she had learned much from the high-society people for whom she performed. Furthermore, he believed that she was difficult to surprise and that she could find her bearings quickly in new situations.

The medium was described as having mood swings going from happiness to melancholy, and from calmness to rage (Morselli, 1908, Vol. 1:130–131). On one occasion she was seen to pass suddenly from a state of crying in devotion on her knees, as she remembered her father, to a burst of laughter (Brisson, 1898:2). Furthermore, she has been frequently described as presenting a variety of symptoms indicative of hysteria (e.g., C. Lombroso, 1909:107,111,113, Morselli, 1908, Vol. 1:126–128).

Regardless of her humble beginnings and possible mental instability, Palladino had a strong sense of self, as exemplified by some stories told about her (P. Lombroso, 1907). In addition, she had a sense of her uniqueness. Courtier (1908) stated that she often said: "There are many doctors and professors, many counts, princes and kings, but in the world there is only one Eusapia!" (p. 480).

The accounts also refer to her early phenomena. Before she developed as a medium she was said to have experienced spontaneous manifestations in childhood which included "hearing raps on pieces of furniture on which she was leaning, having her clothes or the bed-covers stripped from her in the night, and seeing ghosts or apparitions" (C. Lombroso, 1909:39–40). De Rochas (1896:15) referred to hallucinations of eyes seen from the age of eight.

There was a period between 1872 and 1886 in which the seances given were for her "few and loyal friends" (Morselli, 1908, Vol. 1:123; on early seances see Alippi, 1962:130–132). Two early influences were spiritists Giovanni Damiani and (later physician) Ercole Chiaia. According to Biondi (1988:96,124), the first provided advice and direction, while the second became the medium's manager.[5] Morselli (1908, Vol. 1:123) has stated that Palladino saw Chiaia as a father.

Writing in 1872, Damiani stated, presumably referring to Palladino:

> We have here in Naples a medium of extraordinary and varied powers. Her name is Sapia Padalino, a poor girl of sixteen,[6] without parents or friends. She is a medium for almost every kind of spiritual telegraphy known, one of which however is peculiarly her own, and consists in writing with her finger,

> and leaving behind marks as of a lead pencil, while no such article is in her possession or even in the room. She will also take hold of the hand of the sitters, and cause the same phenomenon of leaving traces as of lead pencil under their fingers. In her presence discharges are heard as from pistols; lights are seen across the room like the tail of a comet. She is a seer, a clairaudient, and an impressional medium. (Damiani, 1872)

Another early report was presented in 1889 at the Congrès Spirite et Spiritualiste International held at Paris. The author made reference to phenomena such as the levitation of the medium and to bluish flames that emanated from her (Chiaia, 1890).

Chiaia brought Palladino to the attention of Cesare Lombroso in 1888. In response to an article by Lombroso in an Italian newspaper, Chiaia challenged him in the same publication to investigate the case of a woman of low social class in whose presence furniture elevated in the air, and sounds were heard on walls and on other surfaces, among other phenomena.[7] Chiaia probably saw an opportunity to get publicity and recognition for his medium because of Lombroso's prominence. By that time Lombroso was well-known for his writings on such topics as pellagra, mental illness, and criminals (see *L'Opera di Cesare Lombroso*, 1908).

Lombroso did not take the challenge immediately but sat with the medium a few years later in 1891, and became convinced of the reality of her phenomena (Ciolfi, 1891). This led to the above-mentioned Milan Commission, and to many other studies of her mediumship. In later years Lombroso gave much publicity and endorsement to the medium in his writings (e.g., C. Lombroso, 1908, 1909).

Palladino earned money through her performances, as seen in the roubles she was paid when she went to Russia (Remarks about Eusapia Palladino, 1907:225). In addition, Palladino had a fancy for gold and was given jewels by her rich acquaintances (P. Lombroso, 1907:393). But while she made money from her mediumistic performances, she did not accumulate wealth. Morselli (1908, Vol. 1:124) stated that the medium told him that she was living in poverty. She lived in a small room and had a dry goods store that she ran with little success. Not only did Palladino say that she did not work for money (P. Lombroso, 1907:392), but she was cited in the same article as saying that she did not need much money to live, being happy to live among people from her region dressed "in a petticoat and eating macarroni" (p. 393).[8]

Palladino was said to have suffered from diabetes (C. Lombroso, 1908:176, P. Lombroso, 1907:394, Morselli, 1908, Vol. 2:301). Morselli (1908, Vol. 2:301) commented that her condition was accompanied by nephritis and that, after five years of not seeing her, she looked pale and worn out.[9] By May of 1911 the medium's diabetes was reported to have worsened (Carrington, 1957:18).

Although Palladino held seances after this date (Alvarado, 1982, 1987), she was in rapid decline. She died in 1918 due to nephritis (Miranda, 1918:142). The medium was so well-known that her obituary notices were published in prominent newspapers outside Italy, among them *The [London] Times* and *The New York Times* (Death of Eusapia Palladino, 1918, Palladino Reported as Dead in Rome, 1918).

The Autobiography

The excerpt presented here is an article authored by Palladino that does not seem to have been cited by modern writers who have discussed her mediumship (for an old citation, see Eusapia Paladino: An Unsolved Mystery, 1910). The account, entitled "My Own Story," was published in the February 1910 issue of *Cosmopolitan Magazine* (Palladino, 1910). The magazine was founded in 1886. By the time the Palladino article was published, the magazine had passed through different owners and had had different editorial emphases. During the period in question, the magazine was owned by William Randolph Hearst, who bought it in 1905 (Bekken & Beinhoff, 1995, Landers, 2010). Hearst, a well-known controversial newspaper publisher (Nasaw, 2000), used *Cosmopolitan Magazine* and other publications to present sensational reports of political events. However, the magazine covered other topics as well. According to Schneirov (1994:267), the most frequent topics in the publication for the 1909–1910 period were art, literature, and high culture, as well as politics and current events. That the magazine targeted a wide audience is clear in the content of the volume in which the Palladino article was published (Volume 48, including December 1909 to May 1910). This consisted of many poems and short stories, and of a variety of current events and general interest articles about such topics as babies, Charlemagne, children who will become kings, England's budget, industrial Mexico, the North Pole, peace and battleships, and vivisection. The advertisements at the end of the issue with Palladino's article also reflect the general target audience of the magazine. There were announcements of such products as corn syrup, garden tools, pianos, land in the State of Texas, stockings for men, temperature control devices for the home, and varnishes.

The article about Palladino was summarized as follows in the *American Educational Review*: "The Italian peasant woman, whose demonstrations of a supernormal force, are the marvel and the despair of science, tells the story of her life and work" (The Reader's Index, 1910:317). Its publication took place in the context of Palladino's visit to New York City during November 1909 and June 1910, a trip organized by Hereward Carrington (no date, Part 2, 1954; see also Alvarado, 1993). Before the visit, the American public had been exposed to Palladino's performances through newspaper and magazine reports of her European seances (e.g., Flammarion, 1897, "In a Séance with Eusapia

Paladino," 1908). A prominent example of the latter was Carrington's (1909b) widely cited article "Eusapia Palladino: The Despair of Science."

Unfortunately, the visit to New York City was a disaster for Palladino's reputation. A good proportion of the discussions about her mediumship in the press and in magazines emphasized fraud (e.g., Jastrow, 1910, Krebs, 1910, Münsterberg, 1910), and some of them appeared before the publication of the autobiography (Davis, 1909a, 1909b, Leuba, 1910). Although there were defenses of her mediumship (e.g., Carrington, 1910), as I have argued elsewhere the publicity she received was mainly associated with the idea of fraud (Alvarado, 1993).

Her article appeared with an introduction presenting information about previous seances held with Palladino in Europe and with an insert written by William James (1910). He was skeptical that any valuable investigation could take place in the United States unless there was money to have scientists have several sittings with her. But he ended on a positive note: "That her phenomena *probably are* genuine seems to me established by Flammarion's, Morselli's, Bottazzi's, Courtier's, and the Society for Psychical Research reports. I shall be much surprised if later experts find that the whole repertory is composed of tricks." Nonetheless, James' note reflected the bad associations Palladino's mediumship had obtained due to the problem of fraud, as seen in his mention of her tricks and his view that the way she operated was "detestable."

Palladino's Account

> As a child I knew much hardship. My mother died soon after my birth. I had no grandmother nor aunts, and so was placed by my father in [the] charge of a family who had a farm near my native village of La Pouille. My father gave these people money. He was good, but I needed a mother—no child ever needed a mother more than I. When I was about a year old I had a bad fall. A dent was made in my head, and over this dent the hair has always been white. People have told me that when I am in the trance-sleep a current of air comes from the dent, that the air is cold, and that it has a connection with the things that happen during the seances. It may be so; I do not know.
>
> When I was still very small I was put to work at many little occupations about the farmhouse. I had no play like most children, no companions; it was work always. Before I was ten years old my father was killed by brigands. He had not been able to do much for me, but when he went, so went the little money he had been paying, and that made matters worse. The people with whom I lived did not care for me. I had never known love, and yet I was very sensitive to the dreary coldness which always exists when love is absent. Inwardly I was a shivering

child. Outwardly I was reserved and silent, except when I was angry.

There was a man who had been my father's friend. He was kind-hearted, and he knew that I was unhappy. Because of this he took me to Naples and found a home for me in the house of a husband and wife who were prosperous, but who had no children. They wanted to adopt a little girl. But I did not please them. I did not try. I would not comb my hair, nor eat with a fork. When they endeavored to teach me I would rage, would weep violently, would run from the house. Not until I was hungry would I go back. When I had found something to eat I would steal away to bed and go to sleep with eyes swollen from my tears.

At first my foster-mother would coax and scold me. Afterward she came to let me alone in my excitements. I was too emotional and untamed for her. I know now that she and her husband were good people, and that it would have been well for me if I could have lived with them, in their way. But I could not. One day when I refused to take my piano-lesson my foster-mother told me that if I would not obey her I must leave. She said she would tell my father's friend to come and take me away.

I did not wait for that. Quivering with anger, I ran to my sleeping-room, gathered some things into a bundle, and went into the street. I hurried along half blindly. My knees felt weak, and I trembled. I had not seen my father's friend for a long time, and did not know whether I could find him. I passed through many thoroughfares, and inquired of many people. They could tell me nothing. Nowhere in all Naples could I find my father's friend. But a woman to whom I spoke asked me questions, eyed me, and at last told me to come with her. I had no care now as to where I went, but in a little while we stopped in front of a house in a good quarter of the city. The people within seemed to be much interested in me. Again I answered questions. I told them where I was born, and they uttered exclamations. Years before, they had lived in the same vicinity. They said that I could stay, if I worked hard enough. I learned from their talk afterward that they intended to put me in a convent.

But that was not to be, and it was well. I should have run away. I should have broken all the rules. I could never have become a nun. It was not so written. I could never obey fixed laws. My own will guides me. It is enough. If I suffer from it, very well; it is my own suffering. As far as others are concerned, I would do them no injury, and I believe in God.

While waiting to put me in the convent, my new friends set me to work in their kitchen. I had much to do, and I did it in such a rapid, furious way that they would look at each other, and talk among themselves.

I had no patience; I could not rest. Often I would grow excited without cause. Suddenly I would weep. When I went to sleep at night I would have strange dreams. I have always had them, and sometimes when bad luck is coming I dream of serpents. My friends told me that I frightened them by the way I cried out in my dreams. They saw the priest sooner than they had intended, and it was arranged that I should be taken to the convent on a given day. I had made up my mind that I would not go.

The night that brought the turning-point for me was like any other. In the front rooms of the house there was company. I heard much talk and laughter as I cleaned the pans. It may have been the noise and gaiety that made me breathe fast and shake all over. Why should I, Eusapia Palladino, be nothing but a drudge, one who existed in the dismal shadows, while others laughed at life? I recall that night well. I wanted to break things, to fly out into the darkness, to move swiftly through space to a strange land that I had dreamed of, where, I thought, the people would be like me.

Suddenly my name was called—"Eusapia! Eusapia!" I went to the door of the brightly lighted room, thinking that they wanted me to bring them something. "Wash your hands, take off your apron, brush your hair, and come in here," they commanded. I obeyed them in wonder.

They were sitting around a small table. Their hands were on it, with their fingers touching. Two of them moved aside for me, and I was told to do as they were doing. "She is a strange girl," said my mistress to a gentleman. "Perhaps she can help us. We will see." The lamps were turned down, and we sat in silence.

The gentleman bore down upon the table with his hands. The other side of it rose and then dropped back. It was nothing. He tried many times. Always the table dropped back. I began to have a half dizzy feeling, a swimming of the head. My arms and body seemed to stiffen and shake, as if from a bursting force pushing for release. It was almost pain at first. But relief came. I breathed easily again, and looked up at the others, who had risen and were speaking eagerly. The gentleman was saying, "It is amazing; it is a miracle!"

I was as astonished as they. I could not believe that I, Eusapia the dishwasher, had done things that the clever gentleman called miracles. They told me about these things. They said that the four legs of the table had risen from the floor at once, that some books, untouched by anybody, had moved about, that a decanter of wine on a side-table had risen in the air. They wanted me to try again, but I was afraid. And yet I was happier than I had ever been. In spite of the excitement around me, I was calmer. When I lay down to sleep I felt no more tremblings, and that night I had no strange dreams.

The next day people kept coming in. I found that I was not expected to do my work, but to sit with my mistress in the front room, while her friends gazed at me, and talked of things I did not understand. Nearly every evening at this time there was company. We always sat around the table, and many times, after I had forgotten where I was, they told me that the table had risen, that objects had floated in the air. I did not know why, and did not care. I only knew that I had no more work in the kitchen to do, and that after each of the times we sat around the table I had a feeling of calmness and relief.

In those old days it was my ambition to be a laundress. Even after guests had begun to come nearly every night to the house in Naples, I was thinking of this. I wanted to be independent—away from anybody who could say, "Eusapia, do this, do that; Eusapia, go there, come here."

But one evening there were guests whom I had never seen before, and who did things that were done for the first time in my experience. They looked everywhere, arranged the furniture to suit themselves, and two of them, taking places on either side of me, held my hands and feet. When I had gone to sleep and wakened again, one of the gentlemen, who patted my cheeks, took from his pocket a handful of gold coins. I was dazzled, and could hardly believe that the gold was all for me. When we counted it afterward we found that it made a thousand francs—a fortune! I thought no more of being a laundress. The gentleman was Aksakof, counselor of state to the Czar of Russia.

My powers grew stronger. I will tell you why John King came to me. But an English lady who had been married to a Neapolitan, and who believed in spirits, came first. She knocked at my door one morning and asked for Eusapia Palladino. I bowed and pointed to a chair. She leaned forward as she talked, and told me an odd thing. She said that a message had come to her from the spirit world, and this message was that John King desired to incarnate himself in the body of the medium called Eusapia, if she was willing. It was the first time I had ever heard of John King, but I welcomed him. He was with me at the next sitting, and since then he has never left me. I could not do without his aid.

I have heard that I imagine him. It is not true. Very rarely do I see him, but often he speaks to me, advises me, warns me. He calls me his daughter, and has helped me much in life. He is my guiding spirit, my second father. He was my real father in a previous existence on this earth, and he watches over me as a parent would his child. When I call to him, saying, '"Come, my father, come," he never fails me. He comes. There are strange occurrences, and people marvel. I care not who believes. I know.

I will say here that no other spirits have ever spoken to me. I have seen none. John King has kept them away from me. Sometimes I believe that I feel the presence of my mother, but the influence is not strong, and I have never been altogether sure that she can come to me.

After the visit of Aksakof to me in Naples, people called on me every day to ask for sittings. Learned men and journalists began to come from distant places. But I grew tired of séances. There were matters which I found more interesting. I married. I helped my husband in his shop, cooked and sewed for him. I enjoyed these things, and began to feel that I was like other women. But professors arrived from Paris. Lombroso came. At first I did not like him. He did not believe. He gazed at me with suspicion, asked many questions, and bound me with cords at one of the first séances. I was uncomfortable. And then Lombroso was always taking me away from my husband and my house. But he was very kind and gentle, and I grew to love him, Lombroso, who has passed beyond, and now knows many things that he was trying to learn!

My life became crowded. No more could I tend the shop or think of what my husband might like for dinner. I was taken here and there, into houses and rooms I had not seen before. The professors would tie me. Once they put my hands into iron rings, which I did not like. Several times they had a machine to weigh me during the trance-sleep, and they told me afterward that I had seemed to lose many pounds, which I would regain in a moment. Sometimes the room would be dark, and sometimes it would be light. Sometimes there would be no cabinet. The professors could make the arrangements to please themselves. I did not care, except that I wanted to do as they desired, and knew what conditions would bring the best results. I prayed to God that I might satisfy them, and begged my father, John King, to be with me always.

I traveled. I was taken to Milan, Rome, Carqueiranne, Geneva, Bordeaux, Paris, Cambridge, Warsaw, St. Petersburg. I had not realized before that the world was so big and had so many people. Always the people stared at me, and said things to each other that I did not understand. But always they were kind. Now I come to America, and I weep.

The boys who laugh, are they your journalists? I desire to meet only men. I am not at my ease among those who lack weight in the front of their foreheads, where the soul is. I must have attention, concentration. I have received that from the learned men of Europe. Among them, above all others, I like to sit. I prefer men to women, but it is not a question of sex or country, but of intellect and earnestness. I do not object to doubt. I am accustomed to it. It fades away. I know when they come into the room with me who are the doubters. I like to convince them, and for this

reason it is these that I ask to hold my hands and feet, to look everywhere, to do anything they please to satisfy themselves.

And yet the results are best when I have sympathy, and I am much less exhausted at the end. I am an instrument, to be played upon, like a piano. I give forth what I get from others. If some of those who dominate at a sitting are rude persons, I have discovered that the manifestations are rude and violent. Instead of easy movements, objects are banged about. I cannot control these things.

If the influences at a sitting are not kind and sympathetic, I do not allow myself to sink away into the deep trance-sleep. I am afraid. The connection of hands might be broken, and this hurts me. Other acts which would be injurious to me might be performed. I must be on my guard. I do not dare to trust even John King to protect me when I am so helpless. The deep trance brings the best results, but much can be done before I have begun to sleep, or when I am in the light trance which leads to the deep trance if continued without the resistance of my will. In the light trance I have a consciousness of what is happening. In the deep one I know nothing.

In the light trance I know when I am tired. It happened once in Naples that when I was in this state I felt exhaustion and said that I desired to stop. But my sitters did not want me to, nor did John King. The influences impelling me to keep on were very strong, but my throat was dry from weariness. Some plates had come from a sideboard to the table. A moment later a water-bottle came, but it did not settle on the table. It moved through the air to my lips, and was tilted up. I drank, and was much refreshed.

In the light trance I am anxious to please those who are around me. I am impatient for developments, just as they are, and sometimes, without thinking of what I am doing, I try to start the manifestations. I may press the table with my hands, touch it with my leg. These movements have been called tricks. But in Paris I saw an air-ship start. It was pushed along the ground. Then it soared. "It is a miracle," the people said, and yet the beginning was a push.

Before a séance I may be indifferent, but when the people are around me I have a strong desire to accomplish what is expected of me. It affects my body. I have a feeling of numbness. Goose-flesh rises. In the small of my back I feel the flowing of a current. This ascends to my arms. I move them constantly, because motion on my part seems to help, and that which is desired takes place. It is now that I feel relief. There are thrills. I rest easily, comfortably. Afterward, when I allow myself to sink into the deep sleep, I feel no more, but when I wake up I am depleted—

almost powerless even to lift my hands. And all the next day I must rest.

There are people who say that what has happened must have some easy explanation. They dislike to be mystified, forgetting that the world and the simplest things are mysteries. They seek for causes, and say that I use hooks, strings—that I have human aid. You may judge for yourself. The scientific men who are trying to make discoveries take me alone to the room they have provided. Everybody but themselves is barred out. Often they have women examine my clothing thoroughly. I tell them the best results come when I have a cabinet. They arrange it. I do not see it until I reach the room. They may enter it at will. Two or three of them may sit in it during the séance.

Once in Paris, I was told afterward, they placed wires on the table in positions that would cause a bell to ring if the four legs of the table rose from the floor. If all the legs did not rise, or if I touched the table with my foot or leg, the bell would not ring. It rang often. These scientific men are so careful! But when the séance is over they say they cannot understand. I wish they could. I want to help them. If I should be the means of bringing about some great discovery, I should be very proud, and would feel that my life on this earth had been useful.

This is why I am willing to submit to any test—in the darkness or light, with a cabinet or without it. I will go anywhere. For serious men, who treat me kindly, I am willing to do whatever is suggested. When they obtain results that satisfy them I am happy. But I can never tell. It depends, I think, upon those around me. Before a séance I do not think of it, except to hope that it will be good. In my daily life I sew and cook whenever I get a chance. I like to make little dishes. When the séance comes I do my best. It is my work.

I have been asked why I always request the cabinet. This is because I am accustomed to it. When I have it, new surroundings seem less strange. In the first days I knew nothing of cabinets, but they were provided, and now, from habit, I have come to expect them at my séances. Sometimes I have done without the cabinet, but I have a feeling that it is useful. I will try to explain this to you by an illustration. When I blow out with my lips, the air spreads. You feel it only slightly against your cheek. But when I roll a paper and blow through that, the air comes strongly to you. This, I believe, is the usefulness of the cabinet. It seems to concentrate the force.

I have been asked, too, why I prefer darkness to light. My answer is much the same. In the beginning when they wanted to get good results they turned down the lamps. It was so arranged by those who made the preparations, and now I have grown to want the darkness. I think it is the

> best condition. It brings me greater ease and peace. Light seems to have a disturbing effect upon my mind and body, and the influences are less concentrated. Sudden light, when I am sinking into sleep, is injurious to me. I feel pain in my eyes and head. My heart flutters. I find it hard to breathe. I tremble. But when gentlemen insist upon having the light I am willing, if it is not changed, to have the glare beat upon me.
>
> I have been asked many times for my own explanation, but I have none. I know only that I can feel the force; that it seems to flow out of me; and that I obtain it in part from others. When the chain of hands is broken I can do nothing. Strong men give me added power. The movement of objects corresponds to the movements of my body and to the direction of my will before I have sunk into the deep sleep. After that, as I have said, I know nothing. Perhaps some day we will know all about this force. Only God and his people know now, and perhaps—the devil. (Palladino, 1910:294–300)

Remarks on Palladino's Account

Before I discuss the content of Palladino's essay, we need to consider that in all probability the article was not produced solely by her. Because the medium supposedly did not write or speak English, I presume it was taken by dictation and translated and edited by others, probably members of the staff of *Cosmopolitan Magazine*.[10] Other accounts of the medium's interactions with journalists in New York have included mention of the use of an interpreter (e.g., Paladino Tells About Her Stunts, 1909). In addition, parts of the account are in language that I believe is unlikely to have come from Palladino, even in Italian. This is the case because, as pointed out by Morselli (1907), "Eusapia . . . speaks even Italian very badly, and expresses herself in a corrupt vernacular. . . ." (p. 344).

Because Palladino tended to be dramatic in her interviews with the press (e.g., Eusapia Paladino Explains Herself, 1909), and because some of what appears in this article cannot be corroborated independently, the account should be read with caution. Furthermore, and as pointed out before, the article appeared in the context of the medium's visit to New York City and a generally negative reception of her mediumship. While there is no evidence to support the speculation, it does not seem far-fetched that her autobiographical comments may have been part of the large publicity campaign that characterized her American performances, perhaps as an attempt to present a sympathetic view of the medium's life. If this was the case, *Cosmopolitan Magazine* was a good forum. The wide range of the topics covered in this publication would have assured a wide readership, particularly in New York, where the magazine was published and where Palladino's American seances were held. After all,

magazines were an influential cultural agent in the United States, bringing a variety of ideas and images of different sorts to the American public (Ohmann, 1996, Schneirov, 1994).

Biographical Details

Many of the points discussed by Palladino in her essay are different from previous accounts given by the medium and recorded by other individuals. For example, she wrote that as a child she moved to different houses and that she escaped from one of them. The account given to Paola Lombroso (1907:392) states that she was driven away, not that she escaped. She went to a house of a family from her area of origin who offered her shelter until she could enter a convent.[11] Morselli (1908, Vol. 1:119) mentioned that Palladino simulated that she escaped and that when she was discovered she was put out of the house and ended with a family of acquaintances where she was a nursery maid.[12]

We also learn from the autobiographical essay that in one of those households she was once called into a room where a seance was being held. The essay read: "They were sitting around a small table. Their hands were on it, with their fingers touching. Two of them moved aside for me, and I was told to do as they were doing." According to Morselli (1908, Vol. 1:120), who presumably obtained his information from the medium, she was asked to take the place of a missing sitter.

A detail recounted by Palladino that has different versions is her statement that as a child she fell down and that this produced a dent in her head. In a biographical sketch written with information provided by the medium, it was said that once when she was a year old she was "allowed to fall in such a bad way that a hole was made in her head . . . On this scar a lock of hair has grown that has always been white since infancy . . ." (P. Lombroso, 1907:392). However, there were other versions also credited to the medium. One author recorded that the scar was presumably produced by an accident caused by delirium induced by typhus fever (de Rochas, 1896:14), while another wrote that it was produced "by a blow which her mother-in-law had given her with a saucepan, or, according to another version, for which she is also responsible, by a fall from a window when she was a year old" (C. Lombroso, 1908:167).[13]

Another imprecise piece of information stated by the medium was that she got married. But she neglected to say that, by the time the article appeared (1910), she had been married twice. According to information from the civil registry, she got married in 1885 and in 1907 (Nota, 1918).

That Palladino's account was incomplete is clear from the fact that she did not include two figures important for her early development as a medium that I mentioned in the Introduction: Giovanni Damiani and Ercole Chiaia. However, Palladino mentioned in her essay that she developed love for Cesare Lombroso,

who was very important for her personally and for her work (Alippi, 1962:148).

Palladino also referred to Aksakof, who was said to have given her money after an early seance. He was an important figure in Europe, particularly in Germany, who founded the journal *Psychische Studien* (1874), published important works, and founded and edited the influential *Bibliothek des Spiritualismus für Deutschland*.[14]

In the essay, Palladino refers to her desire to help researchers to make discoveries. In her words: "This is why I am willing to submit to any test. . . . I will go anywhere. For serious men, who treat me kindly, I am willing to do whatever is suggested." There is no question that the medium submitted to many observations and tests during her career. The literature about her contains many examples of her agreeing to specific controls (e.g., Carrington, 1909a:206). But this was not the whole story.

On occasion the medium was a difficult research subject, a topic that she, perhaps understandably, does not mention. She often resisted control. Myers (1895) complained that "Eusapia persistently threw obstacles in the way of proper holding of the hands; she only allowed for a part of the time on each occasion the only holding of the feet which we regarded as secure—i.e. the holding by the hands of a person under the table. Moreover, she repeatedly *refused* any satisfactory test other than holding."[15]

In addition to resisting control, the medium could create difficult situations through other behaviors. For example, Carrington (1909a) stated that once when he checked the position of the medium's feet during a seance she became irritated: "The medium expostulated for three quarters of an hour, and it was a long time before she again consented to resume and again attempted to go off into the trance state" (p. 222). Morselli (1908) has stated that Palladino showed dramatic mood changes, and took offense at "minimal indecision about the reality of her 'phenomena'" (Vol. 1:131). Such moods, Morselli continued, could make her very pleasant or unbearable. This could go to extremes, as Lombroso (1909) illustrated when he wrote that if Palladino felt that her reputation was insulted "she is so violent and impulsive as actually to fly at her adversaries and beat them" (p. 112).

Furthermore, another behavior that made Palladino a difficult research subject was her well-documented propensity to commit fraud (e.g., Carrington, 1909a:182, Courtier, 1908:521–540, Flammarion, 1907:520–521, Samona, 1910:287). She alluded to unconscious fraud in the following passage of her essay: "In the light trance I am anxious to please those who are around me. I am impatient for developments, just as they are, and sometimes, without thinking of what I am doing, I try to start the manifestations. I may press the table with my hands, touch it with my leg. These movements have been called tricks." Discussions of unconscious fraud were frequent in the Palladino literature (e.g.,

Morselli, 1908, Vol. 1:264–266, Ochorowicz, 1896). But some of Palladino's tricks do not seem to have been unconscious (e.g., Flammarion, 1907:520–521). Carrington (1909a) stated that she sometimes tricked for "her love of mischief" (p. 327) and "for the love of the thing" (p. 328).

Comments about Phenomena

Other parts of the essay are about phenomena. Palladino's reference to a "half dizzy feeling" and a "swimming of the head" may have been a reference to her first (or an early) trance. The fact that she stated in the next paragraph that she was told of phenomena that took place in her presence suggests that she had no recollection of the events.

She wrote about the effects of trance. In her words: "The deep trance brings the best results, but much can be done before I have begun to sleep, or when I am in the light trance which leads to the deep trance if continued without the resistance of my will." Lombroso (1909:114) stated that Palladino's most important phenomena took place at the end of her trance, something consistent with Visani-Scozzi's observations (1901, table between pages 392 and 393). Morselli (1907:340) also related the trance to major phenomena. But in a later publication he expressed scepticism about an "absolute correspondence with the depth or the phase of her *trance state*" (Morselli, 1908, Vol. 1:209). In addition, the medium was reported to produce physical effects when she was not in trance (Imoda, 1908:410, de Rochas, 1896:310–314), but these effects tended to be of small magnitude.

As other mediums have done in the past, Palladino commented on influences from sitters. She wrote that "results are best when I have sympathy." This was also noticed by Morselli (1908, Vol. 1:190), who wrote that if a single individual had doubts and disbelief in the phenomena, it was enough to negatively affect the production of the medium. Others, who saw Palladino open to suggestion, commented on the influence of the experimenters' ideas on and expectations of the phenomena (Ochorowicz, 1896, de Rochas, 1896:259).

Palladino wrote in the essay about the effects of light on her: "Sudden light, when I am sinking into sleep, is injurious to me. I feel pain in my eyes and head. My heart flutters. I find it hard to breathe. I tremble." Other observations also showed the apparent effect of light. In a seance, "the strong red light . . . fell directly on to the medium's eyes, which occasioned in her a fit of hysteria; she wept and cried out as if demented, hitting her face repeatedly with her fists. This was a genuine fit of hysteria. . . ." (Aggazzotti, Foà, Foà, & Herlitzka, 1907:367). Another writer stated:

> In proportion as her trance increases, her sensibility to light increases. A sudden light causes difficulty in her breathing, rapid beatings of the heart, an

> hysterical feeling, general irritation of the nerves, pain in the head and eyes, and a trembling of the whole body, with convulsions,—except when she herself asks for light . . . . (Flammarion, 1907:142)

The medium wrote: "Several times they had a machine to weigh me during the trance-sleep, and they told me afterward that I had seemed to lose many pounds, which I would regain in a moment." There were times when she was put on a balance and asked to increase and decrease her weight, which she did successfully (Aksakof, Schiaparelli, du Prel, Brofferio, Gerosa, et al., 1893:10–12). In later studies she was said to increase in weight during table levitations (Courtier, 1908:441).

Another of Palladino's assertions, also mentioned in the literature, was the breeze coming from the above-mentioned scar in her forehead, and what she described as a dent in her head (e.g., de Rochas, 1896:165, Venzano, 1907:106). Carrington (1909a) wrote about his observations together with E. Feilding and W. W. Baggally:

> I examined the famous scar, both with my fingers and optically, and held my hand at a distance of about three inches from her head. The cold breeze was distinctly perceptible. We all felt this in turn, holding Eusapia's mouth and nose, so that she could not breathe. We held our own breaths, and again placed our hands over the famous scar. We felt the breeze as distinctly as ever—it being considerably colder than the temperature of the room. (Carrington, 1909a:198; see p. 205 for observations of cold breezes from the medium's forehead)

Conceptually related to the breeze is the topic of forces or emanations coming out of the body to produce mediumistic phenomena (Alvarado, 2006, 2008). Nonetheless, as I have argued before (Alvarado, 1993), Palladino's mediumship contributed to the development of these ideas in a variety of ways, among them by providing descriptions of her sensations and by the aftereffects of the seance, generally interpreted as the expenditure of her vital force. In her essay, the medium stated: "I have a feeling of numbness. Goose-flesh rises. In the small of my back I feel the flowing of a current. This ascends to my arms. . . . when I wake up I am depleted—almost powerless even to lift my hands. And all the next day I must rest." Closely related to this, de Rochas (1896) said that the process began with the medium's desire to produce the phenomena. This was followed by feelings of "numbness and gooseflesh in the fingers" which increased and were accompanied by feelings "in the inferior region of the vertebral column like a current" (p. 22), a sensation that went through the arm to the elbow, where it stopped slowly. Then the phenomenon was said to take place. In later years Ochorowicz (1909) published notes taken in 1894 in which

he stated that the medium "felt a shiver passing down her back by the arms, up to the fingers, which became numbed . . . ," after which she had a "disagreeable *prickling* in the fingers . . . ." (p. 387).

The aftereffects were also discussed frequently in the literature, as can be seen in the following description: "When the lamps are again lighted, she is seen to be very much changed, her eye dull, her face apparently diminished to half its usual size" (Flammarion, 1907:92). Another observer said that, after the seances, Palladino showed photophobia, hyperesthesia, and hallucinations (C. Lombroso, 1909:115). Furthermore, sometimes her legs were paralyzed and she vomited. The latter was also observed by Faifofer (1903:577).

Concluding Remarks

Autobiographies in general (Bjorklund, 1998), and Palladino's essay in particular, raise questions about the purpose of these documents, particularly when controversy is involved, as was often the case in the medium's career. Can we accept that the account was shaped mainly by the events in Palladino's life, or did the story or legend that grew around the medium construct the narrative? The discrepancies between the present account and previous ones cited throughout the present article suggest the latter.

Palladino's essay is highly selective, leaving out much information about her life and performances. It also presented alternate versions of events, as is realized when the essay is compared to previously published accounts she gave to others. Such impressions are particularly frequent in accounts of the medium's life, making her essay, and previously published accounts, dubious in terms of factual information.

Furthermore, Palladino emphasized positive views of herself through statements such as those about her efforts to help science. While she allowed many tests and controls throughout her career, it is also true that the medium was problematic because of a tendency toward trickery and her occasional resistance to control.

Written during the controversial New York visit in which the press generally presented negative views of her mediumship by emphasizing fraud, the essay offers a positive view of herself to the American public through accounts of her difficult childhood and good intentions. Although I do not have evidence to assert that the autobiography was a public relations scheme designed to alter the negative images of fraud elicited by her American performances, it is possible that the essay performed such a function. And accounts of her sufferings and good intentions may have elicited sympathy in some members of the general public, even if this was not by design.

While there are aspects of the essay that cannot be independently corroborated, there is enough information in the literature about her mediumship

to support some of her statements. This includes the breezes felt issuing from her forehead scar and her physical depletion, among other topics discussed in the previous section.

Eusapia Palladino continues to raise interesting questions for those of us interested in the life of mediums and in the variety of individuals who have influenced psychical research in the past. Regardless of issues of biographical accuracy, or whether the article was meant to persuade or to describe, the essay reprinted here gives us a personal perspective about how one such individual presented herself.

Notes

[1] For overviews, see Carrington's (1909a) book and the shorter discussions of Alippi (1962), Dingwall (1950, Chapter 5), and Tietze (1972). The literature about the medium includes discussion of particular seances (e.g., Alvarado, 1987), phenomena (e.g., Cassirer, 1983), and evidential discussions in the form of critiques (e.g., Wiseman, 1992) and defenses (e.g., Braude, 1997, section 2.3). A unique bibliography about Palladino was compiled by Morselli (1908, Vol. 1:122–124, Vol. 2:xvii–xviii). Many references are also listed by Alvarado (1987, 1993).

[2] Fodor (circa 1933:190–191) presents information about the spirit control John King, who was supposed to have been the pirate Henry Owen Morgan. He is said to have communicated and manifested physically through several mediums (e.g., Olcott, 1875:454–456). De Rochas (1896:16) stated that John King referred to the medium as his daughter and gave her advice on how to take care of herself.

[3] The variety of manifestations listed by Morselli may be better appreciated when it is noted that, in addition to blows and raps, sounds included those presumably made by musical instruments, hands and feet, and voices. In addition to hands, materializations included dark "prolongations" from the medium's body, arms, dark indeterminate forms, and well-formed faces, heads, and busts.

[4] The idea of forces emanating from mediums as a cause of physical phenomena preceded Palladino's mediumship (Alvarado, 2006, 2008).

[5] Morselli (1908, Vol. 1:121) has speculated that Damiani's action consisted of a "suggestive action operating day to day" that impressed the idea of spirit action on the medium. In the first scientific report of Palladino's mediumship, Chiaia was thanked for developing the medium's faculties through years of "zeal and patience, in spite of outcry and denigration" (Aksakof, Schiaparelli, du Prel, Brofferio, Gerosa, et al., 1893:63). Years later, Richet (1922) referred to Chiaia as the "courageous and perseverant protector of Eusapia" (p. 530).

[6] Biondi (1988:96) has reminded us that the young Palladino was 18, not 16.

[7] The letter first appeared in Italian in the newspaper *Fanfulla della Domenica*. It has been reprinted in Italian (Alippi, 1962:133–138), and translated into English (Flammarion, 1907:136–140) and French (Chiaia, 1889).

[8] Furthermore, she stated : "I just do not get any pleasure by being the famous Eusapia and being the fable of all people: I have acquired many good friends, . . . and this is the only profit that I have obtained" (P. Lombroso, 1907:393). While the medium's comments about her simplicity seem overdone, she was described as generous and as a person willing to help others (P. Lombroso, 1907:393). Some writers stated that she showed much mercy toward the unfortunate in general and particularly for abandoned children (Cavalli, 1918). According to Courtier (1908:180), Charles Richet asked

Palladino what she wanted as a present after some seances, and she asked for an artificial leg for an amputee she knew in Naples.

[9] Morselli (1908, Vol. 2:302,482) saw the medium's diabetes as part of the pathological nature of mediumship, sort of a diathesis related to hysteria and other conditions such as renal problems, obesity, neuralgia, and other disorders. In his view: "Mediumship is a metahysterical condition" (Vol. 2:310).

[10] Palladino did not always have good feelings for journalists, whom she accused of spreading false information about her (P. Lombroso, 1907:392).

[11] Courtier (1908:479) wrote that Palladino lived with a grandmother who mistreated her, and that she later lived successively with two families. Morselli (1908, Vol. 1:119) mentioned she lived for a while with her paternal grandmother and that when she was eight years old she moved to another household. He mentioned two households in which she lived after leaving her grandmother. Carreras (1918:135–136) stated that she was in two or three places while in Naples, including the house of a man named Migaldi, a postal worker, where seances were held. In 1872 Achille Tanfani took her to Rome to the family of a man named Pietro Cartoni, where she was for nearly a year before she went back to Naples.

[12] Morselli (1908, Vol. 1:119) interpreted the simulated escape as part of the senseless behaviors and ambulatory subconscious automatisms of some adolescents girls for whom "mediumship can be a psycho–neuropathic substrate."

[13] One commentator stated that after the accident she was "subject to fits of epilepsy, catalepsy and hysteria, and showed anesthesia of touch" (Arcelin, 1900:522).

[14] On Aksakof, see Anastay (1903), Ravaldini (1985), and Wolffram (2009). He was one of the investigators of the famous Milan Commission. In fact, he is said to have invited the medium to have seances with the Commission (Aksakof, Schiaparelli, du Prel, Brofferio, Gerosa, et al., 1893:39), and to have suggested to Richet to go to the Milan seances (Richet, 1933:151). Palladino's concern for Aksakof is perhaps expressed in a letter he wrote to Chiaia in 1907 from St. Petersburg about the medium's visit to Russia. He said that he was in bed for three months and that "our dear Eusapia often comes to see me and keep me company" (Remarks about Eusapia Palladino, 1907:224).

[15] This was a reference to the SPR-sponsored seances held at Cambridge in 1895 (Sidgwick, 1895). Because these seances have been criticized for, among other things, producing a bad psychological environment for the medium (e.g., Ochorowicz, 1896), it may be argued that resistance to control may have been a reaction to the situation. Although such speculation may have some truth, there is no doubt that Palladino could be a difficult subject, and she was so on other occasions.

Acknowledgments

I am grateful to Nancy L. Zingrone and Massimo Biondi for useful suggestions to improve this paper.

References

Aggazzotti, A., Foà, C., Foà, P., & Herlitzka, A. (1907). The experiments of Prof. P. Foà, of the University of Turin, and three doctors, assistants of Professor Mosso, with Eusapia Paladino. *Annals of Psychical Science, 5,* 361–392.

Aksakof, A., Schiaparelli, G., du Prel, C., Brofferio, A., Gerosa, G., Ermacora, G. B., & Finzi, G. (1893). Rapport de la commission réunie à Milan pour l'étude des phénomènes psychiques. *Annales des Sciences Psychiques, 3,* 39–64.

Alippi, T. (1962). Eusapia Palladino. *Luce e Ombra, 62,* 126–155, 210–240, 283–310.
Alvarado, C. S. (1982). Note on seances with Eusapia Palladino after 1910. *Journal of the Society for Psychical Research, 51,* 308–309.
Alvarado, C. S. (1987). Historical notes on a seance with Eusapia Palladino in 1912. *Zetetic Scholar, 12/13,* 61–72.
Alvarado, C. S. (1993). Gifted subjects' contributions to psychical research: The case of Eusapia Palladino. *Journal of the Society for Psychical Research, 59,* 269–292.
Alvarado, C. S. (2006). Human radiations: Concepts of force in mesmerism, spiritualism and psychical research. *Journal of the Society for Psychical Research, 70,* 138–162.
Alvarado, C. S. (2008). Further notes on historical ideas of human radiations: III. The perispirit and mediumistic forces. *Psypioneer, 4*, 85–92. http://www.woodlandway.org/PDF/PP4.4April08.pdf (Retrieved September 1, 2010)
Anastay, E. (1903). Alexandre N. Aksakof. *Bulletin de la Société d'Études Psychiques de Marseille, 2*(n.s.), 21–25.
Arcelin, A. (1900). La dissociation psychologique. *Revue des Questions Scientifiques, 18*(s. 5), 488–542.
Bekken, J., & Beinhoff, L. (1995). Cosmopolitan. In: *Women's Periodicals in the United States: Consumer Magazines* by K. L. Endres & T. L. Lueck (Eds.), Westport, CT: Greenwood Press, pp. 49–57.
Beloff, J. (1993). *Parapsychology: A Concise History*. London: Athlone.
Biondi, M. (1988). *Tavoli e Medium: Storia dello Spiritismo in Italia.* Roma: Gremese.
Bjorklund, D. (1998). *Interpreting the Self: Two Hundred Years of American Autobiography*. Chicago: University of Chicago Press.
Blondel, C. (2002). Eusapia Palladino: La méthode expérimentale et la "diva des savants." In: *Des Savants Face à l'Occulte 1870–1940* by B. Bensaude-Vincent & C. Blondel (Eds.), Paris: La Découverte, pp. 143–171.
Bottazzi, P. (1907). The unexplored regions of human biology: Observations and experiments with Eusapia Paladino. *Annals of Psychical Science, 6,* 149–156, 260–290, 377–422.
Braude, S. E. (1997). *The Limits of Influence: Psychokinesis and the Philosophy of Science (revised edition)*. Lanham, MD: University Press of America.
Brisson, A. (1898). Une Soirée avec Eusapia Paladino. *Le Temps,* December 17, 1898, pp. 2–3.
Carreras, E. (1918). Eusapia Palladino (La Vita). *Luce e Ombra, 18,* 134–138.
Carrington, H. (n.d.). *Personal Experiences in Spiritualism.* London: Werner Laurie.
Carrington, H. (1909a). *Eusapia Palladino and Her Phenomena.* New York: B. W. Dodge.
Carrington, H. (1909b). Eusapia Palladino: The despair of science. *McClure's Magazine, 38,* 660–675.
Carrington, H. (1910). Would Bolster up Palladino's Case. *The New York Times,* May 13, 1910, p. 8.
Carrington, H. (1954). *The American Seances with Eusapia Palladino.* New York: Garrett Publications.
Carrington, H. (Ed.). (1957). *Letters to Hereward Carrington from Famous Psychical Researchers, Scientists, Mediums & Magicians.* Mokelumne Hill, CA: Health Research.
Cassirer, M. (1983). The fluid hands of Eusapia Palladino. *Journal of the Society for Psychical Research, 52,* 105–112.
Cavalli, V. (1918). Per Eusapia Palladino (Un Pio Recordo). *Luce e Ombra, 18,* 165.
Chiaia, E. (1889). Un Défi a la Science. In: *Congrès International Spirite de Barcelone,1888*. Paris: Librairie des Sciences Psychologiques. pp. 123–127.
Chiaia, E. (1890). Expériences Médianimiques. In: *Compte Rendu du Congrès Spirite et Spiritualiste International.* Paris: Librairie Spirite. pp. 326–334.
Ciolfi, E. (1891). Les expériences de Naples. *Annales des Sciences Psychiques, 1,* 326–332.
Courtier, J. (1908). Rapport sur les séances d'Eusapia Palladino à l'Institut General Psychologique. *Bulletin de l'Institut Général Psychologique, 8,* 415–546.
Damiani, G. (1872). A Neapolitan Medium. *Spiritual Magazine, 7*(n.s.), 287.
Davis, W. S. (1909a). An Analysis of the Exploits of Madame Paladino. *The New York Times*,

October 17, 1909, p. SM2.
Davis, W. S. (1909b). Sidelight on the Paladino Delusion. *The New York Times*, November 21, 1909, pp. SM1–SM2.
de Rochas, A. (1896). *L'Extériorisation de la Motricité: Recueil d'Expériences et d'Observations*. Paris: Chamuel.
Death of Eusapia Palladino (1918). *The Times [of London]*, May 18, 1918, p. 9.
Dingwall, E. J. (1950). *Very Peculiar People.* London: Rider.
Eusapia Paladino Explains Herself (1909). *The New York Times*, December 5, 1909, p. SM7.
Eusapia Paladino: An unsolved mystery (1910). *American Review of Reviews, 41,* 234–236.
Faifofer, A. (1903). Fenomeni medianici in Eusapia Paladino. *Archivio di Psichiatria, Scienze Penali ed Antropologie Criminale, 8*(s. 2), 573–580.
Feilding, E., Baggally, W. W., & Carrington, H. (1909). Report on a series of sittings with Eusapia Palladino. *Proceedings of the Society for Psychical Research, 23,* 309–569.
Flammarion, C. (1897). A séance with Eusapia Paladino: Psychic forces. *Arena, 18,* 730–748.
Flammarion, C. (1907). *Mysterious Psychic Forces: An Account of the Author's Investigations in Psychical Research, Together with Those of Other European Savants.* Boston: Small, Maynard.
Fodor, N. (ca. 1933). *Encyclopaedia of Psychic Science.* London: Arthurs Press.
Gutierez, G., & Maillard, N. (2004). *Les Adventuriers de L'Esprit: Une Histoire de la Parapsychologie*. Paris: Presses du Châtelet.
Home, D. D. (1863). *Incidents in My Life*. New York: Carleton.
Imoda, Dr. E. (1908). The action of Eusapia Paladino on the electroscope. *Annals of Psychical Science, 7,* 410–412.
Inglis, B. (1992). *Natural and Supernatural: A History of the Paranormal from Earliest Times to 1914* (revised edition). Dorset: Prism Press.
James, W. (1910). An Estimate of Palladino. *Cosmopolitan Magazine, 48,* 299.
Jastrow, J. (1910). The case of Paladino. *Review of Reviews, 42,* 74–84.
Krebs, S. L. (1910). A woman of mystery—Solved. *Reform, 3,* 343–383.
Landers, J. (2010). *The Improbable First Century of Cosmopolitan Magazine.* Columbia, MO: University of Missouri Press.
Leonard, G. O. (1931). *My Life in Two Worlds*. London: Cassell.
Leuba, J. H. (1910). Eusapia Paladino: A critical consideration of the medium's most striking performances. *Putnam's Magazine, 7,* 407–415.
Lodge, O. J. (1894). Experience of unusual physical phenomena occurring in the presence of an entranced person (Eusapia Paladino). *Journal of the Society for Psychical Research, 6,* 306–336, 346–360.
Lombroso, P. (1907). Eusapia Paladino: Cenni biografici. *La Lettura, 7,* 389–394.
Lombroso, C. (1908). Eusapia Paladino and spiritism. *Annals of Psychical Science, 7,* 167–180.
Lombroso, C. (1909). *After Death—What? Spiritistic Phenomena and Their Interpretation.* Boston: Small, Maynard.
Miranda, G. (1918). Eusapia Palladino Intima. *Luce e Ombra, 18,* 141–144.
Morselli, E. (1907). Eusapia Paladino and the genuineness of her phenomena. *Annals of Psychical Science, 5,* 319–360, 399–421.
Morselli, E. (1908). *Psicologia e "Spiritismo": Impressioni e Note Critiche sui Fenomeni Medianici di Eusapia Palladino* (2 vols.). Turin: Fratelli Bocca.
Münsterberg, H. (1910). My Friends the Spiritualists: Some Theories and Conclusions Concerning Eusapia Palladino. *Metropolitan Magazine, 31,* 559–572.
Myers, F. W. H. (1895). Correspondence: Reply to Mr. Page Hopps, concerning Eusapia Paladino. *Journal of the Society for Psychical Research, 7,* 164.
Nasaw, D. (2000). *The Chief: The Life of William Randolph Hearst*. Boston. Houghton Mifflin.
Nota (1918). *Luce e Ombra, 18,* 138.
Ochorowicz, J. (1896). La question de la fraude dans les expériences avec Eusapia Paladino. *Annales des Sciences Psychiques, 6,* 79–123.

Ochorowicz, J. (1909). A new mediumistic phenomena. *Annals of Psychical Science, 8,* 333–399.
Ohmann, R. (1996). *Selling Culture: Magazines, Markets, and Class at the Turn of the Century.* London: Verso.
Olcott, H. S. (1875). *People from the Other World.* Hartford, CT: American Publishing Company.
L'Opera di Cesare Lombroso nella Scienza e nelle sue Applicazioni (new edition) (1908). Milan: Fratelli Bocca.
Paladino Tells about Her Stunts (1909). *The New York Times*, November 13, 1909, p. 3.
Palladino, E. (1910). My Own Story. *Cosmopolitan Magazine, 48*, 292–300.
Palladino Reported as Dead in Rome (1918). *The New York Times*, May 18, 1918, p. 13.
Ravaldini, S. (1985). I Protagonisti della Ricerca Psichica: Alexandre N. Aksakof. *Luce e Ombra, 85,* 43–54.
The Reader's Index (1910). *American Educational Review, 31*, 308–319.
Remarks about Eusapia Palladino (1907). *Annals of Psychical Science, 5,* 221–225.
Richet, C. (1922). *Traité de Métapsychique.* Paris: Félix Alcan.
Richet, C. (1933). *Souvenirs d'un Physiologiste*. Paris: J. Peyronnet.
Samona, C. (1910). *Psiche Misteriosa: I Fenomeni detti Spiritici, Metapsichici del Richet*. Palermo: A. Reber.
Schneirov, M. (1994). *The Dream of a New Social Order: Popular Magazines in America, 1893–1914*. New York: Columbia University Press.
de Schrenck-Notzing, A. (1925). *Les Phénomènes Physiques de la Médiumnité*. Paris: Payot.
In a Seance with Eusapia Paladino (1908). *The New York Times*, April 19, 1908, p. C3.
Sidgwick, H. (1895). Eusapia Paladino. *Journal of the Society for Psychical Research, 7,* 148–159.
Tietze, T. R. (1972). Eusapia Palladino: A study in paradox. *Psychic, 3*(4), 8–13, 38; *3*(5), 40–45.
Tromp, M. (2006). *Altered States: Sex, Nation, Drugs, and Self-Transformation in Victorian Spiritualism*. Albany, NY: State University of New York Press.
Venzano, J. (1907). A contribution to the study of materialisations. *Annals of Psychical Science, 6,* 75–119, 157–195.
Visani-Scozzi, P. (1901). *La Medianità*. Firenze: R. Bemporad & Figlio.
Wiseman, R. (1992). The Feilding Report: A reconsideration. *Journal of the Society for Psychical Research, 58,* 129–152.
Wolffram, H. (2009). *The Stepchildren of Science: Psychical Research and Parapsychology in Germany, c. 1870–1939*. Amsterdam: Rodopi.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 103–116, 2011 0892-3310/11

ESSAY

Mental Health of Mediums and Differential Diagnosis between Mediumship and Mental Disorders

Adair Menezes, Jr.
adair.menezes@ufjf.edu.br

Alexander Moreira-Almeida
alex.ma@ufjf.edu.br

School of Medicine, Federal University of Juiz de Fora (UFJF), Juiz de Fora, Brazil
Research Center in Spirituality and Health (NUPES) at UFJF, Juiz de Fora, Brazil

Abstract—The issue of the mental state of mediums, and whether experiences considered mediumistic are symptoms of mental disorders, has long been subject to debate. Recent empirical studies may help to shed light on these controversies. As there are only a few studies on the mental health of mediums, findings regarding hallucination and dissociation in non-clinical populations are presented and discussed. Recent studies have not found an association between mediumship and mental disorders. Mediumistic experiences often occur in healthy and well-adjusted subjects. The occurrence of psychotic and/or dissociative experiences alone are not enough for a diagnosis of a mental disorder. It is essential to take into consideration the sociocultural context and the impact of these experiences on a patient's life. In some cases, the emergence of mediumship may appear in the context of physical and mental symptoms, which poses a challenge for differential diagnosis. Further research is still necessary in order to discover enough elements to make a definitive differential diagnosis between mediumship and mental disorders.

Keywords: mediumship—mental health—mental disorders—differential diagnosis

Introduction

A mediumistic experience may be defined as one in which an individual (the medium) purports to be in communication with, or under the control of, the personality of a deceased person or another non-material being (Klimo, 1998, Webster, 1996). The experience of mediumship can occur with or without a trance state. Mediumship, understood as a means of communication with spiritual beings, has been recorded for a long time. Socrates used to make references to a *daemon* who advised him since childhood, telling him when he should avoid an improper action (Plato, 1999). Hebrew prophets receiving messages from God and the angels, Paul having a strong visionary experience

which caused him to convert to Christianity, and the first Christians receiving gifts from the Holy Spirit on the day of Pentecost are examples of such experiences narrated in the *Bible*.

Mediums have frequently provoked suspicion in psychiatry, for the mediumistic experiences tend to be perceived as psychopathological manifestations. Seeing and hearing spiritual beings may be perceived as psychotic hallucinations, and religious states of trance through which some of these beings are "channeled" may be perceived as manifestations of dissociative disorders. Recent empirical studies may help shed light on these controversies and help to differentiate between mediumistic (spiritual) experiences and symptoms of mental disorders.

Everyday Evidence of Psychotic and Dissociative Experiences

Since mediumistic experiences usually involve some kind of hallucinatory or dissociative experiences, for the present paper it would be useful to review some studies about these experiences in the non-clinical population. Although most of the existing knowledge on hallucinatory and dissociative experiences comes from studies with schizophrenic patients or patients with severe psychotic or dissociative disorders, other studies have shown that these experiences occur quite frequently in the non-clinical population. At the end of the 19th century, Sidgwick (1894) together with his collaborators at the Society for Psychical Research interviewed 7,717 men and 7,599 women. They found that 7.8% of the men and 12% of the women reported at least one vivid experience of hallucination. The visual hallucinations concerned both living and dead individuals, and there were also auditory hallucinations. Fifty years later, West (1948), conducting similar research with 1,519 subjects, confirmed the occurrence of hallucinations in 14% of the individuals surveyed.

Tien (1991) found that 10% of the men and 15% of the women in a sample of 18,572 individuals had had hallucinations throughout their lives without presenting other mental disorders. Ohayon (2000) surveyed 13,057 individuals by phone in Great Britain, Germany, and Italy and found that 38.7% of them reported having had hallucinations. Among them, 5.1% had hallucinations once a week or more. Bentall (2000) claimed that for every individual who hallucinates and is diagnosed as schizophrenic, 10 others have had the same experience and have never had (nor will have) a psychiatric diagnosis. Preti, Bonventre, Ledda, Petretto, and Masala (2007), summarizing several surveys, concluded that 10%–25% of subjects in the normal population experienced hearing voices without any objective basis for such.

Research has found that those who hallucinate do not only experience hallucinations, but also often interact with their hallucinations and are able to manage them. Posey and Losch (1983) stated that 5% of all those who

hallucinated in their study had had dialogues with their hallucinations. Romme and Escher (1989) identified that a successful adaptation to the voices may happen in three stages: In the initial stage, the voices appear suddenly in a period of emotional turmoil, causing panic and anxiety; next, the individuals try to develop strategies to cope with the voices; and finally, they consider the voices as parts of themselves that help them.

Studies have indicated a high frequency of dissociative experiences in the non-clinical population. Ross, Joshi, and Currie (1990) assessed a random sample of 1,055 adults from Winnipeg, Canada, and found that 13% of them had a score higher than 20 on the DES (Dissociative Experience Scale), indicating the existence of a high level of dissociative experiences in non-diagnosed people.

Bourguignon (1978), in an anthropological investigation, found that out of 488 societies, 90% of them have created institutionalized forms of trance. In 52% of those, the states are attributed to possession by spiritual beings. Different cultures create distinct, non-pathological forms of trance and possession trance. Therefore, the presented data indicate that we cannot necessarily say that hallucinatory and dissociative experiences are pathological.

Mediumship and Mental Symptoms

The possible relationship between mediumship and mental disorders gained strength in the mid-19th century, when Spiritism emerged along with the search for the consolidation of psychiatry as a respectable medical field. Several reports of the alleged harmful effects that mediumistic practice had on the mental health of its practitioners arose, generating the concept of "spiritist madness." Janet's theory on psychological dissociation was used by several doctors to explain the outbreak of the spiritist madness. According to these authors, psychological dissociation, stimulated by spiritist practices, could become permanent and might cause mental unbalance. Fragile and emotionally unstable people would be especially prone to succumb to this disease, particularly women, who are seen as hysterical (Almeida, 2007, Moreira-Almeida, Almeida, & Lotufo Neto, 2005).

Even the spiritualists/spiritists themselves partially agreed with this view, saying that mediumistic practices could effectively trigger mental disorders in some predisposed individuals. Kardec recommended that all those who "present symptoms, yet minimal, of eccentricity of ideas, or weakening of mental faculties, therefore those with evident predisposition for madness . . . should be removed from their mediumistic duties" (Kardec, 1861/2009:236–237).

Kardec stated that mediumship comes from an organic predisposition and that it did not depend on the individual's beliefs or moral posture. According to him, mediumship can be divided into two large groups: mediumship of physical

effects and mediumship of intellectual effects. Mediumship of physical effects generates observable manifestations in the environment, such as noises and moving objects. These kinds of manifestations may occur voluntarily or involuntarily. Healing mediumship, through which the medium may exercise a curative influence on people, is also included in this category (Kardec, 1861/2009).

Mediumship of intellectual effects uses the medium's mental resources and presents itself in many different ways. Therefore, there are the sensitive mediums who notice the approach and the nature of a spirit, the hearing mediums who can hear them, the seeing mediums who can see them, the speaking mediums who speak for the spirits, the writing mediums who write messages from the spirits, and the healing mediums who cure illnesses. Many of these manifestations are seen in association with trance states, when there is a major or minor loss of the medium's consciousness (Kardec, 1861/2009).

The first mediumistic manifestations might arise in association with several somatic and psychological symptoms. According to some spiritist authors, among the most frequent symptoms are: sensing threatening presences, widespread pain with no diagnosable organic cause, tachycardia, chills, sweating, nausea, sleeping disorders, intense emotional oscillations—from depression to irritability—visual and auditory hallucinations, and so on. School or work activities may be hampered, and family, romantic, or social relationships might be compromised. It might be difficult for the individual who is going through this experience to comprehend and explain what is happening to him, why his thoughts may seem confused and his speech difficult to understand (Armond, 1979). These symptoms may be similar to the psychotic prodrome, the period when psychosis sets in and when the individual may effectively be developing this pathology. The clearest symptoms of the prodrome, such as visual and auditory hallucinations, paranoid behavior, delirious thoughts, and social and occupational impediments, make this psychiatric diagnosis possible when an individual presents the first signs of the emergence of his mediumship (Yung, Phillips, McGorry, McFarlane, Harrigan, et al., 1998, McGlashan, Addington, Cannon, Heinimaa, McGorry, et al., 2007, Cannon, Cadenhead, Cornblatt, Woods, Addington, et al., 2008).

Assagioli (1989) studied the psychological disturbances that may arise in association with the process he called "self-realization," a process through which a channel between the "conscious self" and the "higher self" is established. This psychic opening may cause disturbing visions and voices as well as uncontrollable behaviors, which can be attenuated only if the individual is capable of understanding and controlling his experience and integrating it with his life as a whole.

Grof and Grof (1989) created the concept of spiritual emergency, which

allows them to explain the perturbations associated with the blossoming of mediumship. Spiritual emergencies are critical moments of deep psychological change which may also involve experiences such as uncommon visions, thoughts, and states of consciousness, as well as diverse physical manifestations. They can present themselves as "spiritual emergence" and "spiritual emergency." The former refers to the unfolding of a spiritual potentiality without perturbation of the psychological functions, and the latter is the uncontrolled occurrence of a spiritual experience along with disturbances in psychological, social, and occupational functioning (Grof & Grof, 1989).

The DSM-IV (*Diagnostic and Statistical Manual of Mental Disorders 4th Edition*) made an important breakthrough in the treatment of spiritual issues when a new non-pathological diagnostic category was created, entitled *Religious or Spiritual Problem* (American Psychiatric Association, 1994). Lukoff, Lu, and Turner (1992), proponents of this new perspective, defined spiritual problems as conflicts involving the relationship with transcendental issues or those coming from spiritual practices, and religious problems were perceived as conflicts of faith and doctrine. Spiritual problems, although non-pathological, may look like psychotic or dissociative episodes, which highlights the need to establish definitive criteria for a differential diagnosis between these two distinct categories of experiences.

Jackson and Fulford (1997) assessed five individuals who experienced a period of intense spiritual experiences and who did not present functional deficiencies, comparing them to five other individuals who were recovering from psychotic episodes for which they had a religious interpretation. The individuals said to be healthy had experiences that not only for them, but also for others, seemed to possess a spiritual nature and had beneficial effects on them. They concluded that spiritual experiences and psychotic symptoms cannot be differentiated by the form or content of the symptoms, or even by the similarity to the diagnostic criteria of mental disease of the medical model. It would be necessary to evaluate how much the values and beliefs present in the individual's experience constructively strengthen his/her actions, or how much they contribute to making his actions destructive. The preservation of general life functioning should be seen as an indicator of the healthy character of the individual's experience. As such, it can be said that there are psychotic experiences that may or may not be psychotic symptoms.

Mediumship and Mental Disorders

Recently, studies on psychotic and dissociative experiences occurring in religious and psychiatric environments have received more attention from the scientific community. These studies aim to make a mental assessment of people who have those experiences, in both environments.

Koss (1975) described a spiritist healing practice in Puerto Rico. In it, people arrive suffering from physical and psychological ailments, and there they learn that these ailments are caused by spiritual beings who wish them harm. Trained mediums "channel" the spirits that cause the suffering. The spirits are enlightened and persuaded to stop doing harm to these people. The former sufferers are invited to become mediums themselves, and to help heal other afflicted people. Mediums and afflicted people are similar when experiencing spiritual influences, but the latter have negative results during this experience, while the former can have beneficial results after them.

In another publication, Koss (1977) claimed that one-fifth of those who seek spiritual help in spiritist centers in Puerto Rico are identified by the support group as having the potential to become mediums, but their mental health varies from healthy to frankly pathological. She also stated that the medium's mental health depends on his mental stability before the onset of his mediumship, on the continuity of his training as a medium, and on the efforts of taking care of his own mental health. Still, according to her, the onsets of mediumship are also followed by the loss of the sense of orientation to one's environment and serious crises of emotional oscillation. In a recent publication, Moreira-Almeida and Koss-Chioino (2009) discuss the spiritist treatment offered by spiritist healers, with positive results for those with psychotic symptoms, some diagnosed with schizophrenia.

Hughes (1992) when comparing channelers, i.e. people who claim they "channel" messages from spiritual beings, with patients diagnosed with dissociative personality disorder and also with people regarded as normal, concluded that although the level of dissociation of the channelers is higher than the normal subjects, the patients with dissociative disorder had higher levels of dissociation compared with the other two groups. A very high level of dissociation has become a pathological sign.

Castillo (1994) investigated manifestations of possession in India, starting with the explanation that this condition would arise from a traumatic experience that would produce a dissociation from consciousness as a way to escape an intolerable reality. Nevertheless, he found that in India those cases tend to be seen as states of spiritual possession, caused by spiritual beings that invade and take control of the sick person's consciousness. These spiritual beings may be gods, demons, or ghosts. The treatment applied by the healers is one in which they expel these invading beings from the sick person's consciousness. This treatment seems more natural to the Indian than integrating dissociated parts of a person's consciousness.

Gaw, Ding, Levine, and Gaw (1998) made similar considerations when dealing with 20 patients with dissociative trance disorder in China. The patients presented loss of control over their actions, behavioral alterations, loss

of personal identity, problems distinguishing reality from fantasy, and other symptoms. The possessing agents were perceived as being spirits of the dead or animals, gods, or even demons. Although these patients had the symptoms of a dissociative trance disorder, it was considered more useful for them to be understood and treated according to the cultural reference of spiritual possession, a perception they had from their cultural environment.

Martinez-Taboas (1999) discussed a case of spiritual possession and glossolalia in Puerto Rico in which he tried to identify a dissociative identity disorder. According to this author, indicators of a mental disorder would be: lack of control of the experience, lack of compatibility between the experience and the practice of a religious group, the presentation of psychological suffering, and social and occupational impediments. A healthy mediumistic experience would have to be absent these characteristics.

Beng-Yeong (2000) investigated trance states in patients in a psychiatric hospital in Singapore. The possessing agents were gods, spirits of deceased relatives, spirits of animals, and the Holy Spirit. He defined trance as an altered state of consciousness which causes partial or total amnesia and that can also bring an experience of spiritual possession. The trance state is an indicator of mental disorder if it does not have an apparent stimulus and has a long duration and a harmful result to those who are experiencing it. However, trance states induced by ritual actions will cause controlled states of possession with beneficial results.

Krippner (2000) stated that the dissociative experience which occurs as an involuntary possession in a patient with dissociative identity disorder may occur voluntarily, intentionally, and socially adaptively as mediumistic trance in a medium. The mediumistic possession trance, in this last sense, would be a non-pathological dissociative experience. Krippner (2000) also added the possibility that dissociation begins as something uncontrolled, evolving into something controlled, thereby ceasing to be pathological.

Negro, Palladino-Negro, and Louza (2002) conducted a study with 110 subjects in spiritist centers in the city of São Paulo, Brazil. They investigated dissociative experiences (using the DES), socialization, happiness, religiousness, temperament, and mediumistic experiences and training. Mediumistic activity was associated with an increased DES score, but also with good scores in socialization and adaptation. Mediumistic training offered at the spiritist centers was associated with control of the dissociative experiences. Pathological dissociation was associated with less control of mediumistic activity, younger age, poorer social support, and higher levels of psychiatric symptomatology.

In the United States, Reinsel (2003) analyzed forms filled out by 18 mediums, 14 sensitive people, and 11 individuals chosen as a control group. The mediums were those who publicly acted as such, accepting payment,

while the sensitives were those who, although they had contact with spirits occasionally, did not accept payment for their services. Reinsel found that mediums and sensitive people had a great capacity for absorption as non-pathological dissociation, and revealed levels of anxiety and depression similar to those of the individuals chosen as the control group.

Almeida (2004), Moreira-Almeida, Lotufo Neto, and Greyson (2007), and Moreira-Almeida, Lotufo Neto, and Cardeña (2008) studied 115 active mediums at randomly selected spiritist centers in the city of São Paulo, Brazil. They found that the first symptoms of mediumship generally appeared in childhood. The mediums reported that in their first experiences they felt spiritual presences and had several physical symptoms, sensations, feelings, and thoughts which were not recognized as their own. They also sensed images and voices, sometimes coming from their consciousness or from the physical space around them. Throughout the maturation of their mediumistic experiences, a minority of subjects presented many mood swings. Despite having had multiple psychotic and dissociative experiences, these experienced mediums showed good social adjustment, low prevalence of mental disorders, and low use of mental health services, which demonstrated the absence of psychotic or dissociative disorders in this group.

Alvarado (2005) stated that the study of healthy dissociation is fundamental for a full understanding of the dissociation phenomenon. Many studies claim that most people have dissociative experiences unrelated to traumas, maladjustment, or psychopathology. Small dissociations are present in the regulation of our attention and other psychological processes. Actors who deeply identify with their characters, marathon runners who can avoid feeling exhausted, and mediums who can control their dissociative state show that dissociative tendencies are cognitive resources with potentially positive implications for human performance.

Somasundaram, Thivakaran, and Bhugra (2008) conducted a comparative study in Sri Lanka with 30 psychiatric patients identified as having states of possession, 30 general hospital outpatients, and 30 members of the community known for presenting controlled states of possession trance. A non-pathological assessment of the experience was more probable among those with greater experience with the state of possession. The chronic nature of the possession associated with the integration in a community which tolerates, accepts, and even worships this kind of manifestation appeared as helpful for individuals to control the experience. Some forms of possession that are not compatible with a culturally established tradition suggest a psychotic disorder. The authors suggested that individuals with possession trance disorders be sent for psychiatric treatment, whereas individuals presenting near-healthy possession experiences be sent to the cultural groups that could train and guide those experiences.

Ally and Laher (2008) interviewed six African Muslim faith healers and commented on the perception they have of mental illness and ways to cure it. They argued that the DSM-IV presents mental diseases as being individual dysfunctional manifestations. In Islam there is the belief that certain men and women have sorcery as an innate power which can do harm or good to a person, depending on the evil or healing intention of the sorcerer. They also believe in non-human spiritual beings who, under the power of sorcerers, can possess human beings and therefore do them harm or good. Black Magic can make these spiritual beings possess a person, making them speak differently and giving them superhuman strength, which would be diagnosed in Western culture as a dissociative identity disorder. The healers also claim that people may be the target of evil intentions, which can make the victims lethargic, lose appetite, and have sleep disorders. In Western psychiatry, these would be signs of depression.

These findings in several cultures suggest that having control of the mediumistic experience or not, having a level of preserved mental health or not, and the experience being in accordance or not with an established religious tradition differentiate a healthy mediumistic experience from a mental disorder.

Mediumship and Schizotypy

Some characteristics typically associated with schizophrenia may be occasionally applied to well-adjusted individuals. This has led some authors to speculate the existence of a continuum that goes from one notably schizophrenic condition to other borderline states. It was in this light that the concept of schizotypal personality disorder was coined. Schizotypy was viewed as having a multi-dimensional nature and possessing a wide range of forms (Bentall, Claridge, & Slade, 1989).

Schizotypy has been considered a mild form of schizophrenia in people who, although being vulnerable to developing a psychosis, have different support factors which prevent them from having episodes. Schizotypy is a neutral condition, sometimes associated with good psychological health and at other times associated with bad psychological health (Goulding, 2005).

Goulding (2005) conducted a study in Sweden in which he analyzed 129 questionnaires answered by individuals who reported having had paranormal experiences. The results of this sample allowed the identification of three types of schizotypes: those who had introverted anhedonia, a pattern of reclusion and social isolation, those who presented cognitive disorganization, that is losses in mental function, and those who had low schizotypy, with few signs of schizotypic experiences.

In England, Schofield and Claridge (2007) analyzed 62 questionnaires forwarded to them as a result of an online advertisement looking for people who

had had paranormal experiences and who were willing to participate in a study. They were able to identify positive and negative schizotypes. The positive ones were among those who had a structure of beliefs that helped them to understand and cope with the paranormal experiences. The negative ones were among those who had cognitive disorganization and introverted anhedonia, who had a worse understanding of the experiences and suffered as a consequence of them.

Holt, Simmonds-Moore, and Moore (2008), when assessing questionnaires of 183 college students from three English universities, proposed the existence of four types of schizotypes: the positive schizotypes, who only had unusual experiences; the high schizotypes, who had unusual experiences associated with pathology; the negative schizotypes, who only had pathology; and the low schizotypes, who did not present unusual experiences nor meaningful pathology. The medium, therefore, in this classification, would be seen as a positive schizotype.

Normality and Pathology in Mediumistic Experiences

Johns and Van Os (2001) and Serper, Dill, Chang, Kot, and Elliott (2005), when studying hallucinations in non-clinical populations, proposed that they occur in a continuum, wherein at one end are the healthy individuals and at the other end are the schizophrenic patients. The pathological diagnosis will depend on a higher frequency and intensity of the hallucinatory experience, the coexistence of other symptoms, and damage to the capacity to face and adapt to it in general. Strauss (1969) proposed that the conviction regarding the objective reality of the hallucinatory experience, the absence of cultural support for the experience, the great amount of time involved in it, and the implausibility of the experience regarding socially shared reality are indicators of pathology.

Waller, Putnam, and Carlson (1996) and Martinez-Taboas (2001) wrote about dissociative experiences, proposing that healthy dissociation involves the capacity of absorption and of imaginative involvement, and is a human experience to which all individuals are more or less prone. Lewis-Fernandez (1998) added that healthy dissociation occurs with total control by the individual, in a cultural context which organizes the dissociation, and is meaningful for the person and for others. Butler argued that healthy dissociation is useful in every mental process; facilitates automatic actions and attitudes, mental escape from unpleasant situations, and concentration on absorbing activities; does not have an origin associated with past traumas; occurs in short duration; is mild; and does not block the functioning of the mind (Butler, 2006).

Pathological dissociation manifests itself through dissociative amnesia, depersonalization-derealization disorder, dissociative identity disorder, and trance possession disorder. It expresses a definitely negative psychological

functioning, causes suffering or incapacitation, is involuntary, and is interpreted by the reference cultural group of the individual as being a disease that needs treatment (Lewis-Fernandez, 1998). The experiences are subjective, invisible to others, and negatively affect all domains of experience of an individual (Dell, 2006). Pathological dissociation is also associated with traumatic experiences from the past: chronic, severe, and debilitating for social and psychological functioning (Butler, 2006).

A criterion to differentiate the dissociative experience of healthy possession from the pathological was proposed by Lewis (1989). Non-pathological possession is episodic, occurs in a definite time, is organized, and occurs in a cultural context that bestows it with meaning. Pathological possession, in turn, tends to be chronic, occurs in a non-controlled manner, is not organized, and is not compatible with the cultural context in which the individual is integrated. Training to experience trance possession might differentiate a pathological possession in an individual who is not prepared for it, from one who learned to live and control the experience in a religious group of which he is a part.

Menezes and Moreira-Almeida (2009) made a revision of the criteria proposed in the literature for a differential diagnosis between spiritual experiences and mental disorders:

- Absence of psychological suffering, which demonstrates that the individual is not subjugated by his/her experience.
- Absence of social and occupational impairments, which shows that life is not being hampered.
- The experience has a short duration and happens occasionally.
- There is a critical attitude regarding the unusual nature of the experience.
- Compatibility of the experience with some cultural tradition which gives him/her guidance, training, and social support when exercising his/her mediumship.
- Absence of co-morbidities, since the greater and more severe they are, the more they will compromise experiencing mediumship.
- Control of the individual over the experience, being able to direct it at the time and place it occurs.
- Life becomes more meaningful with the exercise of the experience.
- The individual is concerned with helping others.

The diagnosis of the pathological or non-pathological character of the mediumistic experience of an individual must be done in real-time, together with a followup for a certain period of time. If the afflictive condition which is frequently present in the burgeoning stage of mediumship is overcome, it will allow the recognition of a healthy mediumship at the end of such time.

Conclusion and Directions for Further Studies

Although there has been a long history of association between mediumship and mental disorders, recent studies have not found this association. Mediumistic experiences often take place in healthy and well-adjusted subjects. Simply the occurrence of psychotic and/or dissociative experiences is not enough for a diagnosis of a mental disorder. It is essential to take into consideration the sociocultural context and the impact of these experiences on the patient's life. Sometimes the emergence of mediumship may occur in the context of physical and mental symptoms, which poses a challenge to differential diagnosis. Further research is still necessary in order to ascertain more elements to make a definitive differential diagnosis between mediumship and mental disorders.

Tart (1972) had already pointed out the inadequacy of the traditional scientific approach for studying "Altered States of Consciousness," understood as qualitative alterations in the global standard of mental functioning, which the individual feels are radically different from his habitual functioning, recommending extensive use of empirical observations that can be replicated by other investigators. Heber, Fleisher, Ross, and Stanwick (1989) proposed that studies should be conducted with non-clinical populations so that results can be more generalized for the non-diagnosed population. Reinsel (2003) suggested that larger samples be used and that they be collected from environments where the experiences studied occur more frequently. Almeida and Lotufo Neto (2003) and Chibeni and Moreira-Almeida (2007) recommended, among other things, using several criteria of normality and pathology, assessing the experience multi-dimensionally, and prioritizing longitudinal studies which allow the clarification of the complex causal relationships between the variables associated with spiritual experiences and mental disorders. Levin and Steele (2005) also insist on longitudinal studies, propose the use of operational concepts related to the experiences, and recommend looking for answers to the questions who, what, when, where, why, and how.

In conclusion, we believe that nonpathological mediumship may represent an expansion of the possibilities of the human mind, creating a new set of potentially meaningful experiences for those who experience them and for those who benefit from them.

References

Ally, Y., & Laher, S. (2008). South African Muslim faith healer's perceptions of mental illness: Understanding, aetiology and treatment. *Journal of Religion and Health, 47,* 45–56.

Almeida, A. A. S. (2007). Uma Fábrica de Loucos: Psiquiatria × Espiritismo no Brasil (1900–1950) [An Insanity Factory: Psychiatry × Spiritism in Brazil (1900–1950)]. [Ph.D. dissertation]. Departamento de História do Instituto de Filosofia e Ciências Humanas da Universidade Estadual de Campinas (Unicamp), Brazil. http://www.hoje.org.br/elsh

Almeida, A. M. (2004). Fenomenologia das Experiências Mediúnicas, Perfil e Psicopatologia dos Médiuns Espíritas. [Ph.D. dissertation]. Faculdade de Medicina da Universidade de São Paulo, Brazil. http://www.hoje.org.br/elsh

Almeida, A. M., & Lotufo Neto, F. (2003). Diretrizes metodológicas para investigar estados alterados de consciência e experiências anômalas. *Revista de Psiquiatria Clínica, 30,* 21–28.
Alvarado, C. S. (2005). Research on non-pathological dissociation. *Ciencias de la Conducta, 20,* 31–56. Universidade Carlos Albizu.
American Psychiatric Association (1994*). Diagnostic and Statistical Manual of Mental Disorders IV*. Washington, D. C.
Armond, E. (1979). *Mediunidade*. São Paulo: Editora Aliança.
Assagioli, R. (1989). Self-realization and psychological disorders. In S. Grof & C. Grof, (Eds.), *Spiritual Emergency: When Personal Transformation Becomes a Crisis.* Los Angeles: Tarcher.
Beng-Yeong, N. (2000). Phenomenology of trance states seen at a psychiatric hospital in Singapore: A cross-cultural perspective. *Transcultural Psychiatry, 37,* 560–579.
Bentall, R. P. (2000). Hallucinatory experiences. In: E. Cardeña, S. J. Lynn, & S. C. Krippner (Eds.), *Varieties of anomalous experience: Examining the scientific evidence*. Washington D.C.: American Psychological Association.
Bentall, R. P., Claridge, G. S., & Slade, P. D. (1989). The multidimensional nature of schizotypal traits: A factor analytic study with normal subjects. *British Journal of Clinical Psychology, 28,* 363–375.
Bourguignon, E. (1978). Spirit possession and altered states of consciousness: The evolution of an enquiry. In: G. D. Spindler (Ed)., *The Making of Psychological Anthropology*. Berkeley/ Los Angeles: University of California Press.
Butler, L. D. (2006). Normative dissociation. *Psychiatry Clinics of North America, 29,* 45–62.
Cannon, T. D., Cadenhead, M. D., Cornblatt, B., Woods, S. W., Addington, J., et al. (2008). Prediction of psychosis in youth at clinical risk. *Archives of General Psychiatry, 65,* 28–37.
Castillo, R. J. (1994). Spirit possession in South Asia, dissociation or hysteria? Part 2: Case histories*. Culture, Medicine and Psychiatry, 18,* 141–162.
Chibeni, S. S., & Moreira-Almeida, A. (2007). Remarks on the scientific exploration of "anomalous" psychiatric phenomena. *Revista de Psiquiatria Clínica, 34*(Supplement 1), 8–15. http://www.hoje.org.br/elsh
Dell, P. F. (2006). A new model of dissociative identity disorder. *Psychiatric Clinics of North America, 29,* 1–26.
Gaw, A. C., Ding, Q.–Z., Levine, R. E., & Gaw, H.–F. (1998). The clinical characteristics of possession disorder among 20 Chinese patients in the Hebei Province of China. *Psychiatric Services, 49,* 360–365.
Goulding, A. (2005). Healthy schizotypy in a population of paranormal believers and experiments. *Personality and Individual Differences, 38,* 1069–1083.
Grof, S., & Grof, C. (Eds.) (1989). *The Stormy Search for the Self: A Guide to Personal Growth through Transformational Crisis.* Los Angeles: Tarcher.
Heber, A. S., Fleisher, W. P., Ross, C. A., & Stanwick, R. S. (1989). Dissociation in alternative healers and traditional therapists: A comparative study. *American Journal of Psychotherapy, 43,* 562–574.
Holt, N. J., Simmonds-Moore, C. A., & Moore, S. L. (2008). Benign schizotypy. Investigating differences between clusters of schizotypy on paranormal belief, creativity, intelligence, and mental health. *The Parapsychological Association & The Society for Psychical Research 51st Annual Convention Proceedings,* pp. 82–96.
Hughes, D. J. (1992). Differences between trance channeling and multiple personality disorder on structured interview. *Journal of Transpersonal Psychology, 24,* 181–192.
Jackson, M., & Fulford, K. W. M. (1997). Spiritual experience and psychopathology. *Philosophy, Psychiatry and Psychology, 4,* 41–65.
Johns, L. C., & Van Os, J. (2001). The continuity of psychotic experiences in the general population. *Clinical Psychology Review, 21,* 1125–1141.
Kardec, A. (1861/2009). *The Medium's Book*. Rio de Janeiro: Federação Espírita Brasileira. Free PDF at http://www.innerenlightenment.com/files/Mediuns_Book.pdf
Klimo, J. (1998). *Channeling: Investigations on Receiving Information from Paranormal Sources*. Berkeley: North Atlantic Books.
Krippner, S. (2000). A cross-cultural model of dissociation and its inclusion of anomalous phenomena. *European Journal of Parapsychology, 15,* 3–29.
Koss, J. D. (1975). Therapeutic aspects of Puerto Rican cult practices. *Psychiatry, 38,* 160–171.
Koss, J. D. (1977). Social process, healing, and self-defeat among Puerto Rican spiritists. *American Ethnologist, 4,* 160–171.
Levin, J., & Steele, L. (2005). The transcendent experience: Conceptual, theoretical and epidemiological perspectives. *Explore: The Journal of Science and Healing, 2,* 89–101.
Lewis, A. J. (1989). *Ecstatic Religion.* London: Routledge.

Lewis-Fernandez, R. (1998). A cultural critique of the DSM-IV dissociative disorders section. *Transcultural Psychiatry, 35,* 387–340.
Lukoff, D., Lu, F., & Turner, R. (1992). Toward a more culturally sensitive DSM-IV: Psychoreligious and psychospiritual problems. *The Journal of Nervous and Mental Disease, 180,* 673–682.
Martinez-Taboas, A. (1999). A case of spirit possession and glossolalia. *Culture, Medicine and Psychiatry, 23,* 333–348.
Martinez-Taboas, A. (2001). Dissociative experiences and disorders: A review. *International Journal of Parapsychology, 12,* 131–162.
McGlashan, T. H., Addington, J., Cannon, T., Heinimaa, M., McGorry, P., et al. (2007). Recruitment and treatment practices for help-seeking "podromal" patients. *Schizophrenia Bulletin, 33,* 715–726.
Menezes, A., Jr., & Moreira-Almeida, A. (2009). Differential diagnosis between spiritual experiences and mental disorders. *Revista de Psiquiatria Clínica, 36,* 69–76. http://www.hcnet.usp.br?ipq/revista
Moreira-Almeida, A., Almeida, A. A. S., & Lotufo Neto, F. (2005). History of spiritist madness in Brazil. *History of Psychiatry, 16,* 5–25.
Moreira-Almeida, A., & Koss-Chioino, J. D. (2009). Recognition and treatment of psychotic symptoms: Spiritists compared to mental health professionals in Puerto Rico and Brazil. *Psychiatry, 72,* 268–283.
Moreira-Almeida, A., Lotufo Neto, F., & Cardeña, E. (2008). Comparison of Brazilian spiritist mediumship and dissociative identity disorder. *The Journal of Nervous and Mental Disease, 196,* 420–424.
Moreira-Almeida, A., Lotufo Neto, F., & Greyson, B. (2007). Dissociative and psychotic experiences in Brazilian spiritist mediums. *Psychotherapy and Psychosomatics, 76,* 57–58.
Negro, P. J., Jr., Palladino-Negro, P., & Louza, M. R. (2002). Do religious mediumship dissociative experiences conform to the sociocognitive theory of dissociation? *Journal of Trauma and Dissociation, 3,* 51–73.
Ohayon, M. M. (2000). Prevalence of hallucinations and their pathological associations in the general population. *Psychiatry Research, 97,* 153–164.
Plato (1999). Apologia de Sócrates. In *Pensadores: Sócrates*. São Paulo: Editora Nova Cultural.
Posey, T. B., & Losch, M. E. (1983). Auditory hallucinations of hearing voices in 375 normal subjects. *Imagination, Cognition and Personality, 3,* 99–113.
Preti, A., Bonventre, E., Ledda, V., Petretto, D. R., & Masala, C. (2007). Hallucinatory experiences, delusional thought proneness, and psychological distress in a nonclinical population. *The Journal of Nervous and Mental Disease, 195,* 484–491.
Reinsel, R. (2003). Dissociation and mental health in mediums and sensitives: A pilot survey. *Proceedings of the Parapsychological Association 46th Annual Conference;* Vancouver; August, 2003; pp. 200–221.
Romme, M., & Escher, A. (1989). Hearing voices. *Schizophrenia Bulletin, 15,* 209–216.
Ross, C. A., Joshi, S., & Currie, R. (1990). Dissociative experiences in the general population. *American Journal of Psychiatry, 147,* 1547–1552.
Schofield, K., & Claridge, G. (2007). Paranormal experiences and mental health: Schizotypy as an underlying factor. *Personality and Individual Differences, 43,* 1908–1916.
Serper, M., Dill, C. A. P., Chang, N. M. A., Kot, T. P., & Elliot, J. M. A. (2005). Factorial structure of the hallucinatory experience: Continuity of experience in psychotic and normal individuals. *The Journal of Nervous and Mental Disease, 193,* 265–272.
Sidgwick, H. (1894). Report on the Census of Hallucinations. *Proceedings of the Society of Psychical Research, 10,* 25–252.
Somasundaram, D., Thivakaran, T., & Bhugra, D. (2008). Possession states in northern Sri Lanka. *Psychopathology, 41,* 245–253.
Strauss, J. S. (1969). Hallucinations and delusions as points on continua function. *Archives of General Psychiatry, 21,* 581–586.
Tart, C. T. (1972). States of consciousness and states-specific sciences. *Science, 176,* 1203–1210.
Tien, A. Y. (1991). Distribution of hallucinations in the population. *Social Psychiatry and Epidemiology, 26,* 287–292.
Waller, N. G., Putnam, F. W., & Carlson, E. B. (1996). Types of dissociation and dissociative types: A taxometric analysis of dissociative experiences. *Psychological Methods, 1,* 300–321.
Webster (1996). *Webster's Comprehensive Dictionary of the English Language.* Naples, Florida: Trident Press International.
West, D. J. (1948). A mass observation questionnaire on hallucinations. *Journal of the Society of Psychical Research, 34,* 187–196.
Yung, A. R., Phillips, L. J., McGorry, P. D., McFarlane, C. A., Harrigan, S., et al. (1998). Prediction of psychosis: A step towards indicated prevention of schizophrenia. *The British Journal of Psychiatry, 172*(Supplement 33), 14–20.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 117–120, 2011 0892-3310/11

LETTERS TO THE EDITOR

Thought Processes

Professor McDaniel's excellent review of *Neither Brain nor Ghost (*by W. T. Rockwell) and *Radical Embodied Cognitive Science* (by A. Chemero) in the Summer 2010 *JSE* (*JSE 24*(2):327–335, *Book Reviews*), brings to mind the simple but often overlooked rebuttal of any hypothesis tending to deny our ability to reason legitimately. This was well-expressed by the popular British philosopher C. E. M. Joad in his *Guide to Modern Thought* (London: Pan, 1948) at a time rife with accusations that our thought processes were merely rationalizations of our prejudices or unconscious desires. The proponents tended to forget that their own arguments would be subject to the same drawbacks, and thus were not worthy of serious consideration.

Norman Allentoff
Senior Research Associate, Kodak (Retired)
17 Stuyvesant Road, Pittsford NY 14534
Lentof62@aol.com

Thoughts on the "Survival/Super-Psi" Argument

The Meiji Restoration, a chain of revolutionary events which led to modernization and Westernization of Japan, can be regarded as a surprisingly peaceful process considering the scale of the political, social, economical, and cultural changes it made, symbolized by the bloodless surrender of Edo Castle, the residence of the shogun and location of the shogunate in the Edo period (1603–1868). One of the crucial reasons for its success was that the leaders of the pro- and anti-shogunate factions shared the view that, with the impending threat of the foreign powers, they should cooperate and avoid a civil war for the sake of Japan.

Of course, history abounds with the opposite case where leaders of factions within a country, sticking to their positions, ended up with a civil war, which led to the destruction of the country they intended to save.

I often recall these historical "lessons" when I read the "survival/super-psi" argument in the *Journal* and in other places. Of course, the issue itself is of vital scientific importance, and such papers as Braude (1992) and Sudduth

(2009) among others have contributed greatly to deepen our understanding of the problem.

However, we should always be aware that the "outside world" is by and large critical of the very existence of psychic phenomena. It is well-illustrated by the late Professor Ian Stevenson's reply to Professor Braude's (1992) criticism:

> Critics of this evidence have hitherto focused almost exclusively on its authenticity and have assailed its credibility at real or imagined points of weakness. It is encouraging to find oneself engaged in controversy over interpretation with an agreed assumption that the cases brought into the discussion actually occurred with satisfactory closeness to the reports we have of them. (Stevenson, 1992:145)

Taking into consideration the general attitude of the outside scientific communities at the present stage, it can be harmful to the development of the field to pay too much attention to the interpretation of the phenomena. I believe that we should spend more energy to accumulate well-established data showing that something paranormal does occur, as Kelly (2010) suggests for mediumship research.

In so doing, I also believe that adopting Visoni's (2010) suggestion is promising which is originally proposed for the study of cases of the reincarnation type but can be extended to other types of research as well: Placing as much material as possible, such as audio and video recordings, on the Internet in order to generate more knowledge and interest among the scientific community.

I hope that the Society for Scientific Exploration website will be one such location where evidence for paranormal phenomena is accumulated so that the "outsiders" can get to know of their existence and examine their authenticity.

Masayuki OHKADO
Department of International Relations, Chubu University, Japan
ohkado@isc.chubu.ac.jp

References

Braude, S. E. (1992). Survival or super-psi? *Journal of Scientific Exploration, 4,* 127–144.

Kelly, E. F. (2010). Some directions for mediumship research. *Journal of Scientific Exploration, 24,* 247–282.

Stevenson, I. (1992). Survival or super-psi: A reply. *Journal of Scientific Exploration, 6,* 145–149.

Sudduth, M. (2009). Super-psi and the survivalist interpretation of mediumship. *Journal of Scientific Exploration, 23,* 167–193.

Visoni, V. M. (2010). How to improve the study and documentation of cases of the reincarnation type? A reappraisal of the case of Kemal Atasoy. *Journal of Scientific Exploration, 24,* 101–108.

Remarks on Eusapia Palladino

I would like to offer some comments regarding recent discussions of the medium Eusapia Palladino published in the *JSE*.

Antonio Giuditta (*JSE 24*(3):511, Fall 2010, *Historical Perspective*, The 1907 Psychokinetic Experiments of Professor Filippo Bottazzi) stated that Italian physiologist Filippo Bottazzi believed that the medium's physical phenomena were produced by the projection of anomalous limbs. While the author mentioned that there were precedents to this supposition, his discussion did not make it clear that such an idea was part of a wider theoretical model, the general assumption of which was that the phenomena of physical mediumship were produced by the emanation or projection of forces from the body of mediums (Alvarado, 2006). As I have argued before, Palladino's mediumship represents an important chapter in the history of ideas of mediumistic forces (Alvarado, 1993).

The literature about Palladino has observations of presumed materialized arms or shapes similar to those mentioned by Bottazzi (de Rochas, 1896:9,292, Morselli, 1908, Vol. 1:198,212, Venzano, 1907:100–101). Oliver Lodge (1894) wrote about "temporary prolongations" from Palladino's body. In his words:

> I myself have been frequently touched by something which might most readily be described as such a prolongation or formation, and have sometimes seen such a thing while it was touching another person. But the effect on an observer is usually more as if the connecting link, if any, were invisible and intangible, or as if a portion of vital or directing energy had been detached, and were producing distant movements without any apparent connexion with the medium. (Lodge, 1894:335)

Perhaps this is similar to what others referred to as "an invisible prolongation of the organism of the medium" (Flammarion, 1907:423), and "ectoplasmic pseudopods" (Richet, 1922:562).

In another contribution to the *JSE*, Michael Grosso (*JSE 24*(4):705, *Essay/Review*, Reflections on Frederic Myers' Romantic Psychology, Winter 2010) rightly commented on how little interest some leading members of the Society for Psychical Research showed about the medium's personality. This neglect of the medium's psychology is particularly noticeable when compared to the writings of some other (continental) European authors (e.g., Morselli, 1908, Ochorowicz, 1896).

Unfortunately, there are no detailed full-length biographies of the medium. Interesting details about her private life were presented by Paola Lombroso (1907), the daughter of Cesare Lombroso, who interviewed the medium (see

also Miranda, 1918). Most of what we know about her comes from sections or works authored by psychical researchers such as Carrington (1909), de Rochas (1896), and Morselli (1908). The latter author also discussed topics such as the medium's confused recollections, as well as her poverty, hysterical symptoms, and mood swings (Morselli, 1908, Vol. 1:117,124,126–128,130–131, respectively), among other topics.

Carlos S. Alvarado
Scholar in Residence, Atlantic University
215 67th Street, Virginia Beach, VA 23451
carlos.alvarado@atlanticuniv.edu

References

Alvarado, C. S. (1993). Gifted subjects' contributions to parapsychology: The case of Eusapia Palladino. *Journal of the Society for Psychical Research, 59,* 269–292.

Alvarado, C. S. (2006). Human radiations: Concepts of force in mesmerism, spiritualism and psychical research. *Journal of the Society for Psychical Research, 70,* 138–162.

Carrington, H. (1909). *Eusapia Palladino and Her Phenomena.* New York: B. W. Dodge.

de Rochas, A. (1896). *L'Extériorisation de la Motricité.* Paris: Chamuel.

Flammarion, C. (1907). *Mysterious Psychic Forces.* Boston: Small, Maynard.

Giuditta, A. (2010). The 1907 psychokinetic experiments of Professor Filippo Bottazzi. *Journal of Scientific Exploration, 24*(3), 495–512.

Grosso, M. (2010). Reflections on Frederic Myers' romantic psychology. J*ournal of Scientific Exploration, 24*(4), 701–714.

Lodge, O. J. (1894). Experience of unusual physical phenomena occurring in the presence of an entranced person (Eusapia Paladino). *Journal of the Society for Psychical Research 6,* 306–336.

Lombroso, P. (1907). Eusapia Paladino: Cenni biografici. *La Lettura, 7,* 389–394.

Miranda, G. (1918). Eusapia Palladino intima. *Luce e Ombra, 18,* 141–144.

Morselli, E. (1908). *Psicologiae "Spiritismo": Impressioni e Note Critiche sui Fenomeni Medianici di Eusapia Palladino* (2 vols.). Turin: Fratelli Bocca.

Ochorowicz, J. (1896). La question de la fraude dans les expériences avec Eusapia Paladino. *Annales des Sciences Psychiques, 6,* 79–123.

Richet, C. (1922). *Traité de Métapsychique.* Paris: Félix Alcan.

Venzano, J. (1907). A contribution to the study of materialisations. A*nnals of Psychical Science, 6,* 75–119.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 121–130, 2011 0892-3310/11

ESSAY REVIEW

Unorthodox Concepts of Force and Psychic Phenomena

Les Radiations Humaines: Introduction à la Démonstration Expérimentale de l'Existence des Corps Subtils de l'Homme [Human Radiations: Introduction to the Experimental Demonstration of the Subtle Bodies of Man] by Raoul Montandon. Paris: Félix Alcan, 1927. 407 pp.

Laboratory Investigations into Psychic Phenomena by Hereward Carrington. Philadelphia: McKay, ca 1939. 255 pp. Reprinted by Kessinger, 2006, $28.95 (paperback).

Le Magnétisme Animal: Étudié sous le Nom de Force Neurique Rayonnante et Circulante dans ses Propriétés Physiques, Physiologiques, et Thérapeutiques [Animal Magnetism: Studied Under the Name of Radiant and Circulating Neuric Force in Its Physical, Physiological, and Therapeutic Properties] by Alexandre Baréty. Paris: Octave Doin, 1887. 662 pp. Available free at http://books.google.com/

L'Extériorisation de la Sensibilité: Étude Expérimentale & Historique [The Exteriorisation of Sensibility: Experimental & Historical Study] (5th updated edition) by Albert de Rochas. Paris: Chamuel, 1899. 300 pp. Available free at http://www.archive.org/details/lextriorisation00rochgoog

L'Ame Humaine: Ses Mouvements, ses Lumières, et l'Iconographie de l'Invisible Fluidique [The Human Soul: Its Movements, Its Lights, and the Iconography of the Fluidic Invisible] by Hippolyte Baraduc. Paris: Georges Carré, 1896. 299 pp. Available free at http://books.google.com/

L'Evolution Animique: Essais de Psychologie Suivant le Spiritisme [Animic Evolution: Essays on Psychology According to Spiritism] by Gabriel Delanne. Paris: Chamuel, 1897. 368 pp. Available free at http://www.archive.org/details/lvolutionanimiq00delagoog

There is a long history of unorthodox concepts of force related to the human body, an idea coming from antiquity (Amadou, 1953). The books reviewed here are relatively late examples of such a conceptual tradition used to explain psychic phenomena. I am referring to the idea that there were "vital,"

"magnetic," or psychic forces, emanating from and surrounding human beings, that could serve as carriers of information and as the means to produce healing and other physical actions when projected from the human body.

As I have discussed in recent years (Alvarado, 2006, 2009), such concepts were used in the mesmeric, spiritualistic, and psychical research literatures to explain a variety of phenomena. Following Franz Anton Mesmer (1734–1815), the so-called mesmerists postulated that "animal magnetism" was the means by which trances and healings could be induced, and the media for transmissions of thoughts and feelings at a distance. One of them, Baron Jean du Potet de Sennevoy (1796–1881), argued that:

> The nervous, active atmosphere of the magnetizer, no doubt augmented by the impulse of his will . . . enters into rapport with the passive nervous atmosphere of the magnetized person, and augments the latter to the point that, in some cases, it seems that there is a real saturation of the nervous system. (Du Potet, 1868:316; [this and other translations are mine]).

The idea was extended later to account for the phenomena of spiritualism. For example, many individuals writing since the nineteenth century discussed the phenomena of physical mediums as being caused by the exteriorization of some sort of biophysical force coming out from the body of the medium.

In his book *Les Radiations Humaines,* Swiss scholar Raoul Montandon (1877–1950) presented an overview of phenomena believed to be caused by these emanations. The topic of "human radiations" was related to that of subtle bodies in the Introduction. Montandon had chapters about Reichenbach's Od, auras, luminous phenomena, and a variety of other phenomena he believed were manifestations of this force. Some of these phenomena included photographic effects, acceleration in the growth of plants, and movement of objects. The latter included effects on a variety of instruments, many of which had moving needles believed to react to these forces. Such effects, the author wrote, could be caused by "an intra-organic radiation, a human fluid" (Montandon:373–374).

Montandon concluded that the information presented in the book showed the reality of human radiations, something that supported a vitalistic outlook of existence. He saw human beings as "a detector, an energy transformer and generator . . ." (Montandon:403).

Regardless of the validity of this belief in a radiation with physical properties, there is no question that Montandon's work is still a valuable resource to modern readers for its review of a literature that has been forgotten by many. Contemporary readers will find many bibliographical references and summaries of the work of well-known figures (e.g., de Rochas, Joire, Kilner, Ochorowicz, Reichenbach) as well as those who are less-known today (e.g., Baréty, Bertholet, Bourg de Bozas, Léger, Tromelin).


Hereward Carrington

British-born Hereward Carrington (1880–1958), who lived most of his life in the United States, was well-known as a researcher and a popularizer of psychic phenomena. He covered some of Montandon's topic in his *Laboratory Investigations into Psychic Phenomena*, but in a briefer way. The value of Carrington's book lies mainly in his report of empirical tests of various devices believed by some to detect unorthodox forces. This work was conducted at the American Psychical Institute directed by himself.

Carrington reported the results of tests with a variety of devices used to detect forces related to the human body via the movement of needles and other parts of the instrument. These instruments have been referred to as "magnetometers," even though they were non-magnetic devices. The results did not support the existence of an unknown force. Carrington stated:

> We have experimented with . . . more than fifty different varieties of magnetometers. . . . In every case we have been enabled to determine the cause or causes responsible for the movement of the magnetometer needle. (Carrington:113)

However, Carrington discussed more than unorthodox forces in his book. His book included much information about the use of instruments in psychical research. The first chapter was an overview of this work. In addition there was a useful list of researchers (9–14), of instruments used to study "vital radiations" (49–54), and a chronology of relevant research work (36–41).

While Montandon's and Carrington's works covered a wide ground, the rest of the books reviewed here were more specific. One such work was Alexandre Baréty's (1844–1918). He was a physician convinced that there was a "neuric" force similar to animal magnetism. In *Le Magnétisme Animal,* probably the most systematic and detailed research monograph of the late neo-mesmeric movement, he defined this force as a dynamic agent

> . . . probably from the nervous system, which circulates along the nerves or *radiates* out of them . . . and is susceptible to producing certain sensitive, motor, and psychic modifications on other human bodies. (Baréty:xii)

Baréty divided the book in two sections. In the first one he reported tests conducted with a lady he referred to as Mlle C., while in the second he reported work with other individuals. In Baréty's view the neuric force was projected from the body through passes, as well as through rays coming from the fingers, from eyesight, and from breath. Inside the body the force had properties such as heat and electricity, and once projected from the body and directed toward another person the force produced effects such as trance, anesthesia, hyperesthesia, and the induction or dissipation of contractions. Baréty believed the neuric force propagated through space through the ether and that the force could be transmitted through other objects and could be stored in water and in other things.

Baréty gave many examples of the physiological effects of the force. For example, he treated Mlle C.'s stomach pains by pointing her fingers at her, which he said caused her pain to disappear in seconds. Baréty also claimed to be successful with Mlle C. in other ways. He was able to "anesthetise and hyperesthesise the integuments of different regions . . . abolish or exalt one or another sense" (Baréty:326). While Mlle C. was in another room separated from him by a brick wall, Baréty said he was able to induce muscular contractions in one of his subject's wrists and hands by pointing his fingers to the wall.

In Baréty's view the existence and therapeutic value of the neuric force was beyond doubt. Furthermore, he believed that hysteria was related to the force. In his view it was due to a "modification in the direction, the force, and the distribution of nervous or *neuric* currents" (Baréty:627).

Another representative of French neo-mesmerism was Lieutenant Colonel Albert de Rochas (1837–1914), well-known in his day for his numerous publications about hypnosis and psychic phenomena. One of his best-known works was *L'Extériorisation de la Sensibilité*, first published in 1895 but reviewed here in its fifth revised edition.

The opening chapter of de Rochas followed in the tradition of some of the old mesmerists, among them A. A. Tardy de Montravel (1785), who reported that mesmerized subjects saw luminous phenomena, and more particularly the magnetic force emanating from the mesmerizer. De Rochas wrote that his previous studies of the stages of hypnosis led him to conclude that in some hypnotic conditions "some subjects acquire a momentary hyperexcitability of sight that allows them to see effluvia in full light. . . ." (de Rochas:6). This included observations of luminous emanations from magnets that, according to de Rochas, were not very consistent. In his words, "the same subject even varies sometimes in the affirmations from one moment to another . . . ." (de Rochas:8).

The author conducted much research with sensitive individuals hoping to determine that such perceptions were objective and not the effect of suggestion.

Observations made with a subject named Albert L. suggested to de Rochas that the perceptions were objective. For example, in some tests the subject reported lights from the poles of an electromagnet. When the poles were reversed without his knowledge

> . . . not only the descriptions of the effluvia corresponded perfectly with the operations during the twenty-two tests conducted but the subject even noticed the passage of the current at a time when the operator believed he had removed it. (de Rochas:22)

Lieutenant Colonel Albert de Rochas

The second chapter was devoted to the phenomenon of exteriorization of sensibility in which the tactile sensations of the hypnotized or mesmerized subject were projected at a distance from their physical body. In one test, de Rochas used two participants, a sensitive observer (A) and a person who was hypnotized (B). The observer reported seeing what looked like layers positioned a few centimeters from B's skin. The author wrote:

de Rochas' exteriorization sensitivity layers

> If I, as magnetizer, act on this layer in any way, B feels the same [sensation] as if I acted on his skin, and he does not sense anything or almost anything if I act in any other place than on the layer; he does not feel much if he is acted upon by a person who is not in rapport with the magnetizer.
>
> If I continue magnetization, A sees forming around B a series of equidistant layers separated by a space from 6 to 7 centimeters [of width] . . . and B does not feel touches, [or] prickings, . . . the sensibility diminishes proportionally to its distance from the body. (de Rochas:56)

In the rest of the book, de Rochas discussed spells and other ancient practices and beliefs that may be related

to the above-mentioned phenomena of sensibility, including aspects of sympathetic magic. In some of his tests he had projected the sensibility of a person to a photograph and found she felt pain when the photo was pricked. The topic of forces was further discussed in several appendices, one of which was a reprint of an excerpt written by German philosopher Carl du Prel (1839–1899) on the topic of Reichenbach's Od.

Dr. Hippolyte Baraduc

Another French student of the subject, and one who received much publicity during his lifetime, was French physician Hippolyte Baraduc (1850–1902). In *L'Ame Humaine* he reported work to detect instrumentally what he believed were manifestations of the soul. While the material, he wrote, manifests "thanks to a solar or artificial exterior solar light, the fluidic invisible manifests by its *own intimate and intrinsic luminous force*" (Baraduc:4). Baraduc described in the book what he believed were ways to show the reality of the "fluidic invisible."

The author started with what he called "biometry," a topic he explored in a previous book (Baraduc, 1893). This referred to the movements of a needle suspended from a thread believed to define certain patterns reflecting the action of the soul on the physical world. He claimed to have found that the "movements of life" showed seventeen different "formulas." The latter refers to numerical readings of the instrument corresponding to the right and left hands, which showed attraction and repulsion of the force, respectively. Baraduc claimed he had more than one thousand observations showing that while the right side of the body attracted "cosmic life," the left one did the opposite, pushed it back. Normal states reflected balance between right attraction and left repulsion. But some "formulas" could indicate particular health problems, including mental conditions.

Baraduc believed that his measures were not due to artifacts coming from environmental or body influences. Instead, he wrote, they were due to "our own animic movements, those of the *Soul* in its physical and psychical manifestations" (Baraduc:26).

Other parts of the book were about the photography of invisible forces. With the exception of some electrophotography, this was mainly achieved using conventional photographic equipment taking photos in darkness, hoping

that the plaque was affected "by the effluvia, the emanations, the intimate vibrations" (Baraduc:34) of the target object. The soul, usually invisible to the human eye, was believed by Baraduc to be able to impress a photographic plate. He postulated the existence of seven different emanations.

The first photo presented was that of a boy feeling sorry for a dead pheasant. Baraduc claimed that some patterns seen in the photo, similar to marks made by a brush, were a photographic record of the vital force of the child reflecting his animic state. These and many other anomalous photos were seen by the author as proof of the existence of these forces. In addition to Od, which he described as the threads of the cosmic life, he referred to other forces or subtle bodies, among them the ones he called Somod, Psych-icon, and Ob.

In the Conclusion Baraduc hoped that his readers believed that there was a soul. Unfortunately, his language and assumptions were unclear at best. No empirical evidence was presented for countless affirmations about the nature of these forces and their interactions and functions. An example was the assertion that: "The physical soul is the product of the vital instinct of the inferior cosmos" (Baraduc:288). It is actually very difficult to follow the author's way of thinking, and his theoretical assumptions seem to take on a life of their own. Perhaps this is why a reviewer of the book stated: "Currently, the role of the researcher is not to explain, but to accumulate facts" (Battandier, 1896:556). To complicate matters, in the last pages of the book Baraduc related some of his ideas to religious teachings and to concepts of universal life and its essence.

A similar problem appears in the ideas presented by Gabriel Delanne (1857–1926) in *L'Evolution Animique*. Delanne was an influential French leader in the movement of spiritism. He came into prominence in the movement after the death of the influential French educator Allan Kardec (pseudonym of Hippolyte-Léon Denizard Rivail, 1804–1869). In the book, Delanne discussed aspects of the action of the spirit during its life on Earth. This involved ideas obtained through mediumistic communications that he believed offered a solution to the explanation of many mental and physiological phenomena.

In addition to the physical body and to the spirit, Delanne discussed the "perispirit," which was (and still is) a key explanatory concept in spiritism. He wrote: "All Spirits . . . are covered with an invisible envelope, intangible and imponderable. This fluidic body is called perispirit" (Delanne:12). Such subtle body or force allowed the spirit to interact with the body and was the instrument through which physical phenomena were produced (e.g., table turning).

Delanne argued that the perispirit was the principle behind memory, and behind what others considered to be the subconscious mind. Instead of postulating brain mechanisms or a psychological subconscious, he believed that recollection and dissociation was a function of this vital principle, one that could act abnormally on occasion. During such abnormal states as epilepsy,

or through the use of drugs or hypnosis, the rhythm of the perispirit varied, causing anomalies in the recollection process. The new memories produced in the secondary state were in a different "vibratory plane" (Delanne:226) than the older memories. When the "vital aura" returned to its usual activity, Delanne stated, older recollections came back. In this view it was possible to have more than two memory records, which he believed explained the phenomenon of multiple personalities. These ideas were applied by the author to explain observations about dissociative phenomena, such as the already classic case of Félida X. (b. 1843), and some of the observations reported by Pierre Janet (1859–1947), which were very influential at the time.

But Delanne also believed that the perispirit had morphological functions. He postulated that it served as a blueprint by which the formation of the body was guided in its development from the embryo. The nervous system, Delanne affirmed, was the "material reproduction of the perispirit" (Delanne:175). The perispirit "possesses the organigenic laws that keep the fixity of the organism in the milieu of the unceasing mutations of material molecules" (Delanne:47). Borrowing from the influential French philosopher of physiology and medicine Claude Bernard (1813–1878), Delanne referred to the directing or guiding influence of the perispirit. In his discussion of life, Bernard had mentioned the existence of currently unknown processes different from physico–chemical ones that contained a guiding or directing idea. "In every vital germ," wrote Bernard (1865:162), "there is a creative idea that is developed and that manifests by means of organization." Associating spiritism with Bernard probably served many functions, among which was an attempt to normalize the ideas presented in the book.

The author also affirmed that the fluids described by the spirits would help us to understand matter. Evolution, he also wrote, involved the progress of the spirit over centuries of reincarnations. In its early development

> . . . the envelope of the soul is crude . . . ; its vibratory movement is of the most inferior form. The work of the soul consists of purifying this envelope, getting rid of its fluidic scoria. . . . (Delanne:358)

The ideas of force and subtle bodies expressed in the above-mentioned books were to a great extent the result of concepts borrowed from a variety of occult-related traditions (Amadou, 1953), as well as from scientific fields of previous times. The latter includes past ideas from neurophysiology and its concepts of nervous fluids (Brazier, 1984) and the explorations of electricity and magnetism of physics (Harman, 1982). In eras where electricity was wondrous and the telegraph extended our reach of communications, it made sense to many to conceptualize psychic phenomena in physicalistic ways involving forces. A late example, among many, was the statement that "psychic waves, like hertzian

waves in wireless telegraphy, propagate at a distance. . . .” (Denis, 1900:291). Interestingly, many of these ideas of force were not purely physicalistic. Both Baraduc and Delanne referred to the soul in their writings as a higher guiding principle.

These works presented a mix of empirical observations and speculation. The assurances about the existence of certain principles we see in the works of Baréty, Delanne, and de Rochas were not always supported by the observations. In fact, what we see are speculations based on some observations, but growing much beyond the available evidence.

The ideas discussed in this review survive to this day in the New Age, occult, and spiritistic literature and in other movements. But they are not favored in most academic circles, including some of those open to the reality of parapsychological phenomena. A portion of the latter today emphasizes a view of consciousness that is nonphysical and nonlocal, a perspective that considers ideas such as the ones discussed in the books reviewed here as superseded concepts that are not supported by the facts. As I have pointed out before (Alvarado, 2006), with the rise of the influence of the new experimental parapsychology of J. B. Rhine and others, phenomena such as extrasensory perception and psychokinesis were seen by some as nonphysical processes supporting the existence of the mind. Such an emphasis came from the apparent independence these phenomena showed from distance, obstacles, and time.

Regardless of the validity of the ideas discussed in these books, it is important to recognize the existence of this conceptual tradition of unorthodox concepts of force. These were and still are powerful ideas that have been influential over time and that can teach us much about past theoretical thinking to account for psychic phenomena.

Carlos S. Alvarado
Scholar in Residence, Atlantic University
215 67th St., Virginia Beach, VA 23451
carlos.alvarado@atlanticuniv.edu

References

Alvarado, C. S. (2006). Human radiations: Concepts of force in mesmerism, spiritualism, and psychical research. *Journal of the Society for Psychical Research, 70,* 138–162.

Alvarado, C. S. (2009). Modern animal magnetism: The work of Alexandre Baréty, Émile Boirac, and Julian Ochorowicz. *Australian J. of Clinical and Experimental Hypnosis, 37,* 1–15.

Amadou, R. (1953). Esquisse d’une histoire philosophique du fluide. *Revue Métapsychique, No. 21,* 5–33.

Baraduc, H. (1893). *La Force Vitale: Notre Corps Vital Fluidique, sa Formule Biométrique.* Paris: Georges Carré.

Battandier, A. (1896). Photographie de l'invisible. *Cosmos: Revue des Sciences et Leur Applications, 35,* 552–556.
Bernard, C. (1865). *Introduction a l'Étude de la Médicine Expérimentale*. Paris: J. B. Baillière.
Brazier, M. A. B. (1984). *A History of Neurophysiology in the 17th & 18th Centuries.* New York: Raven Press.
Denis, L. (1900). Psychologie expérimentale: Phénomènes d'extériorisation et de dédoublement. *Annales des Sciences Psychiques, 10,* 291–294.
Du Potet, Baron (1868). *Manuel de l'Étudiant Magnétiseur* (4th ed.). Paris: Germer Baillière.
Harman, P. M. (1982). *Energy, Force, and Matter: The Conceptual Development of Nineteenth-Century Physics*. Cambridge: Cambridge University Press.
Tardy de Montravel, A. A. (1785). *Essai sur le Théorie du Somnambulisme Magnétique*. London.

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 131–152, 2011 0892-3310/11

ESSAY REVIEW

Extreme Phenomena and Human Capacity

The Physical Phenomena of Mysticism by Herbert Thurston, edited by J. H. Crehan. London: Burns Oates, 1952. 419 pp. ASIN B0000CI8RW.

William James once remarked that the best way to understand the nature of a psychological phenomenon is to focus on its most extreme manifestations. Attention on the bland and the commonplace won't get us very far. James was writing about religion when he said this, explaining why he planned to discuss saints and mystics in *Varieties of Religious Experience*, and not the stale and unprofitable institutional features of religious belief. By analogy, I want to focus on some extreme manifestations of paranormality. The chapters in *The Physical Phenomena of Mysticism*, first published in 1952, were written by the Jesuit scholar Herbert Thurston, and focused on phenomena related to mystical experience: phenomena, often extravagant and outrageous, but well-attested and critically examined by Thurston. Thurston professes to offer no explanation of the phenomena, only to sift good from bad evidence. So we are led back to the people James said should most concern us in religious studies: the saints and mystics who apparently are also the agents of big paranormal physical effects.

Before we review these effects, and consider what they might imply for human capacity in general, and, incidentally, for parapsychology, we should say something about Thurston's sources and his critical methods. This is important because apart from the general animus toward "paranormal" phenomena from many otherwise intelligent scholars, such phenomena, when linked to "religious" sources, are additionally likely to become suspect and aggravate irrational resistance. The present reviewer has no apologetic agenda, but is curious about the phenomena for what they may imply about the scope of human capacity.

The editor of this volume, J. H. Crehan, says in the Preface that Thurston's chapters were culled from publications first appearing between 1919 and 1938 in *The Month*, *The Catholic Medical Guardian*, and *Studies*. Closely related to the material in the present book are two other books by Thurston,[1] whose content we will try to ignore. A glance through the pages of our review book will show the variety of sources the author relied upon: historical documents, the *Acta Sanctorum* of the scholarly Bollandists (reference for readers), the biographies of saints, assessments of medical authorities, depositions of

eyewitness evidence given under oath from the beatification and canonization processes, and written sanctions and animadversions of the Promoter of the Faith (also known as the Devil's Advocate). If evidence of this type be suspect or deemed inferior, then the same must be true for the whole of historical study, for legal or medical adjudications, and for the business of everyday life whenever doubts and questions arise as they constantly do, and we are forced to make an inference to the best explanation, based on the available evidence. Thurston acknowledges that there are grounds for concern with "imperfectly proved miracles," noting that witnesses who depose evidence, however well-meaning about their sworn testimony, may nonetheless be detected "straining toward edification" more than exact truth. Moreover, the processes themselves may be defective, failing to give dates or any indication of the character or reliability of specific witnesses.

> The marvelous event deposed to by a single witness in extreme old age who had heard the story in his youth from some third person unnamed, is set down as a fact with the same trustful confidence with which the biographer records the details attested independently by a dozen different contemporaries who had lived in daily intercourse with the Saint and had been the spectator of all his actions. (p. 2)

Thurston is aware of the mixed value of the materials he is working with and throughout his accounts keeps calling attention to weaknesses and whatever else strikes him as questionable. Despite qualifications about the mixed status of the evidence, Thurston took the evidence of psychical research seriously, but seems to rank it as a form of "natural . . . magic," and claims that the evidence he has collected of saintly psi sometimes surpasses in quality that which has been garnered by psychical researchers (p. 2); no doubt there are instances in which a spontaneous case is treated with less acumen or thoroughness than Thurston managed in his best cases. But this seems about all he is justified in claiming.

He also makes an empirical statement he defends but does not emphasize. "Throughout Holy Writ, from the days of Pharaoh to those of Simon Magus, the position seems to be taken up that while true believers do not possess any monopoly of signs and wonders, the mighty works which they perform by the power of the Most High are in every way more stupendous than the prodigies of natural or diabolical magic with which they are placed as it were in competition" (p. 1). It seems from this phrasing that the "natural magic" phenomena (of psychical research) are guilty by association with the "diabolical," and perhaps for that reason alone one must suppose of dubious quality. Thurston takes a politely adversarial stance toward Spiritualism and psychical research, and occasionally takes a mild poke at Frederic Myers, but never really loses

his objectivity or critical imagination, even if it tends (as I think it does) to weaken his own point of view. This objectivity is evident in his treatment of the phenomena of Mollie Fancher, which causes Thurston to hesitate about his conception of the supernatural.

What should we make of the assertion that saintly psi is "in every way more stupendous" than the "natural" psi studied by secular investigators? At first glance, Thurston has a point: The case for saintly levitation (the subject of the first chapter of the book) is indeed "more stupendous" than the case for levitation by "natural magic" of the anomalous upliftings of D. D. Home. Home famously levitated out of a window several stories above ground and then back in another window in the presence of several highly articulate English lords. Thurston draws on a critique of Home's levitation by the skeptical Frank Podmore, who felt that the stagy way the levitation was produced, along with the dim light and heightened expectations of the witnesses, meant the incident could reasonably be explained as some kind of involuntary group hallucination. This is probably psychical research's best levitation case; Thurston's evidence is indeed much more robust; numerous cases (not merely one) of levitations of the human body took place in broad daylight (not in the dim light of a moonlit room); were seen by numerous and various witnesses repeatedly; happened suddenly and unexpectedly (were not part of any staged event); and caused unbearable embarrassment to the saints, who were horrified by all the attention. On the face of it, this is a slam-dunk for Thurston's thesis.

But that thesis may be an artifact of the limited scope of our evidence and of our understanding of the phenomenon. Thurston's "competitors" may not have the levitation cases that he can draw upon, but they do have some, and different forms of, levitational behavior. There is good evidence for table tilting, and for full levitation of objects by mediums such as Eusapia Palladino, as well as reports of poltergeist phenomena that involve various telekinetic (ergo levitational) happenings.[2] There are the group experiments of Kenneth Batcheldor that reportedly have produced complete levitation of physical objects. Finally, Podmore's critique of the Home case is not definitive. The point: Our data are primitive and incomplete; we know nothing of the extent, which may be considerable, of levitation among Hindu saints and mystics or ecstatic Sufis or in contexts of shamanic ecstasy or diabolical possession (around which swirl tales of levitation).

The concentrated number of ecstatics who have reportedly levitated in Christian Europe, and which seemed to peak during the Baroque period, were the product of a peculiar culture, psychology, physiology, and of a uniquely evolved belief-system, which seems to have elicited that particular form of paranormal manifestation in such abundance. The force, power, or agency that underlies the successful dice-throwing experiments of Rhine, the biasing

of quantum processes with Schmidt machines, the surly and blackly comical shenanigans of poltergeists, and the ecstatic levitations of the saints may well be rooted in some unknown hyper-system of human capacities; we should not be surprised that this feebly understood system takes on a variety of forms, and for all we know will assume new forms in the future we cannot even imagine now. The rare, culture-specific explosion of ecstatic levitations discussed by Thurston deserves our interest and careful study; however astonishing, it does not prove intervention by the "Most High" unless by "Most High" we choose to stipulate a modest hypothesis of *a mind at large*.

One other introductory comment: It should be said that the Catholic Church is not in the business of marvel-mongering, which is why the Devil's Advocate, the trials or *processi*, and indeed other inquisitorial procedures have always played a role in the Church's cautious, bureaucratic procedures for miracle-and-saint ratification. As the most skillful exposers of weaknesses (or outright fraud) of evidence for the paranormal are psychical researchers and parapsychologists, so have church officials and investigators been no less skillful in exposing fraudulent or weak claims to saintly marvels, and Thurston doesn't hesitate to deflate major figures. For example, some later writings on Francis of Assisi talk of his levitations, but Thurston shows there is no evidence for this most popular of Catholic saints being ecstatically uplifted into space. He may have done it, but the evidence isn't there. Thurston tracks the likely reason for the legend arising that Francis did levitate in the ambiguity of a word used to describe his behavior, *suspendebatur*, indicating his entranced state, *not* that he was suspended in space (p. 7). As I will attempt to show, Thurston's scrupulous sense of evidence keeps pushing him toward qualifying one of his basic religious premises.

Now let's turn to what will seem a very strange catalogue of inexplicable physical phenomena. We cannot present much detail, the wealth of eyewitness narratives, or the full historical breadth of cases. At best we can provide a few samples and perhaps some short comments. Let's begin with a remark of Thurston about acquiring good evidence for levitation: i.e. any unexplained uplifting of a human body—usually, in the cases that interest us—of a person in some ecstatic, enraptured state of consciousness. And yet, to acquire evidence for levitation should be a simple matter. One needs technical knowledge to interpret (say) an apparent miraculous (or paranormal) healing; it's different with levitation. Anybody with a functioning sensory system, normal intelligence, and speech capacity can observe and accurately report a person's body rise off the ground, float or fly or remain suspended, whether inches or yards away, or whether for a few seconds or many minutes or hours. Note the circumstances in which saintly levitation occurs: in broad daylight, many times in many places, and suddenly. The phenomena are like seizures, and occur during ecstatic states.

The forms of levitation we are discussing are related to, and in part caused by, a peculiar state of mind. A state of mind can thus directly alter (however transiently) the geometry of space–time, which must be so if we think of gravity in terms of Einstein's general theory of relativity. If certain states of mind can affect (and indeed suspend) a property of physical reality so fundamental as gravity, it says something about the status of mind and consciousness in nature. What it says contradicts mainstream views that reduce mind to a causally vacuous byproduct of brain processes. Levitation implies something fundamental about the power of mind directly to suspend fundamental physical processes.

The levitators are the ecstatics. Consider the case of a Sienese Capuchin nun Passitea who died in 1615. Thurston reminds us that the biographer was an Arabic scholar with a keen sense of evidence who wrote:

> According to the violence of the ecstasy she was lifted more or less from the ground. Sister Felice deposed that she had seen her raised three *braccia*. Sister Maria Francesca more than four *bracchia* and at the same time she was completely surrounded with an immense effulgence of light. This lasted for two or three hours. On one occasion at Santa Fiori in the house of the Duchess Sforza, when she was present with a crowd of other people, Passitea was surprised by a rapture, under the influence of which she remained raised from the ground at the height of a man. The Duchess, who was a witness of the occurrence, caused an attestation of the fact to be drawn up, which was signed by all present. (p. 29)

As solid eyewitness testimony, we see the phenomenon from the external perspective of a third person. Fortunately, we also have good first-person accounts of what is feels like to be levitated in Chapter XX of Teresa of Avila's autobiography.[3] The rapture phase of the ecstatic experience once it commences is irresistible.

> . . . often it comes like a strong, swift impulse before your thought can forewarn you of it or you can do anything to help yourself; you see and feel this cloud, or this powerful eagle, rising and bearing you up with it on its wings. . . . When I tried to resist these raptures, it seemed that I was being lifted up by a force beneath my feet so powerful that I know nothing to which I can compare it, for it came with a much greater vehemence than any other spiritual experience and I felt as if I were being ground to powder. (p. 191)

Although she admits at first feeling fear and trying (without success) to resist these extraordinary feelings, she notes one of the interesting aftereffects: "The favour also leaves a strange detachment," hard to describe except to say that not just her spirit but her body feels "a new estrangement from things of

earth." This in turn results in a kind of distress also hard to describe. It should be noted that Thurston cites independent witnesses who deposed testimony confirming Teresa's strange upliftings. Thurston provides other examples of well-evidenced levitation; the case of Joseph of Copertino (1603–1663) is the strongest for testimony from multiple witnesses, and going on pretty steadily for thirty-five years.[4]

We can conceptually arrange Thurston's phenomena according to the feature of nature that they impinge upon. For example, in levitation gravity is impinged upon; it is bracketed; suspended. Or consider accounts of strange "luminous phenomena"; the target domain now is light, like gravity, a fundamental feature of physical nature. In the chapter dealing with inedia, the impacted domain are the normal mechanisms of nutrition, a basic feature of biological nature. And so on—until we observe the physical mechanisms that normally operate when an organism dies also suspended and impinged upon.

So the chapter on levitation is about *gravity*; in a related way, so is Chapter IV, titled *Telekinesis.* Thurston notes that levitation is a form of telekinesis (or to use the more recent term *psychokinesis*). The general idea is direct mental agency causing physical change outside one's own body. Whereas parapsychology is familiar with dice experiments that illustrate paranormal movements, a different form of telekinesis is discussed in this chapter, "the alleged transference of the Host through the air by some unexplained agency from the altar or the hands of the officiating priest to the lips of the expectant communicant" (p. 141). Thurston begins by quoting a Promoter of the Faith from 1755 (p. 142) to the effect that such telekinetic movements of the Host have no moral significance in themselves, and may be produced by good or bad individuals (presumably diabolically influenced). Thurston then details the cases of several nuns and pseudo-mystics who were caught faking these flights of the Host. The faked performances are motivated by the fact that genuine cases were sufficiently familiar to serve as convincing indicators of sanctity. It would make no sense to fake a phenomenon that nobody believed was authentic; nobody would forge a check unless there were checks that people accepted and cashed as genuine.

There is time for one example of the telekinetic Host. The agent is the mystic Catherine of Genoa; the witness, a priest, her confessor and biographer, Raymond of Capua. As we keep finding, the alleged telekinetic events with the Host occur when the communicant is *ecstatic*—in exit from their normal minds. Raymond tells of a time when he and Catherine arrived in Siena fatigued from a long journey and Catherine had the intense desire to receive Communion; so the priest donned his vestments and consecrated the Host, which lay on the corporal before him. He glanced at Catherine whose face was radiant with expectation. Remarking to himself with pious wonder on this sight, he wrote later (as part of an elaborately conscientious report): "I know and am certain

that I saw the Sacred Host move of Itself without the intervention of anyone and come towards me" (p. 146). Presumably, this was movement meant to hasten Catherine's Communion.

Others witnessed the phenomenon. As reported in Mother Francis Raphael's *Life of St. Catherine,*

> Fr. Bartholomew Dominic tells us in his deposition that he frequently gave her Holy Communion, and that often at the moment of doing so he felt the Sacred Host agitated, as it were, in his fingers, and escape from them of Itself. "This at first troubled me," he says, "for I feared lest the Sacred Host should fall to the ground; but It seemed to fly into her mouth. Several persons have told me that the like happened to them when giving her Holy Communion." (p. 145)

One more piece of testimony about Catherine's animated Host, from Francesco Malevolti, a witness in the process:

> I often saw her communicate, and always in ecstasy; and I beheld when the priest was about to give her the Body of our Lord, before he had drawn more than a palm's length near her, the Sacred Host would depart out of his hands and like an arrow shoot into the mouth of the holy virgin. (p. 145)

One major difference from other types of psychokinesis described by parapsychologists is the enormous concentration of meaningfulness that the telekinetic Host is endowed with. Thurston puts it like this:

> Certainly if telekinesis exists at all upon this earth—and levitation itself is sometimes reckoned as a particular development of it—it is difficult to imagine any conditions under which the power of spirit over matter is more likely to be displayed than in relation to those consecrated species which already in some way belong simultaneously to the two realms of soul and of sense. (pp.149–150)

Stigmata and *Tokens of Espousal*—Chapters II and III have in common puzzling and truly striking dermal phenomena. The chapter on the stigmata is very long (pp. 44–129) and complicated, and we can only touch on a few points. To begin with, the stigmata—the seeming reproduction of the wounds of Christ's crucifixion—is a phenomenon with a history. When first reported of St. Francis it made an immense impact on contemporaries. In a letter to the Provincial of France, an eyewitness, Brother Elias, wrote: "I announce to you great joy, even a new miracle. From the beginning of ages there has not been heard so great a wonder . . ." (p. 44). Although Thurston is deeply interested in the stigmata, and says that fifty or sixty truly anomalous cases have been well-documented, many of them in the 19th and 20th centuries, he has misgivings

about whether they can be explained by natural psychology—if not explained, closely allied to *parapsychology*. He also wonders about the relationship of stigmata to sanctity.[5] Could they be symptoms of hysteria?

The majority of experiencers of the stigmata have been women—even though the phenomenon began with a man in the 12th century and has returned with a vengeance with Padre Pio's marathon fifty-year performance as stigmatist.[6] In Victorian times when hysteria was a fashionable concept, stigmatics tended to be hysterical. This old concept has been broken up into different components, and today and we look for somatization or attention-seeking disorders.

For Myers hysteria was a "dissolutive" form of dissociation, which may apply to some pseudo mystics, for example, pretenders that the Sacred Host appears on their tongues. Authentic saints shun publicity, whether the attention of admirers or the ill will of opponents. The daily struggle is to gain control over what is judged to be the lower self, which would seem to be contrary to the spirit of hysteria, which revels in the descent. The saintly quest is to crush normal human nature; to cease reacting, to detach oneself from everything, and be open to the one great thing however one conceives it, often designated God.

There is however perhaps one feature of hysteria—profound affective capacity—that may come into play during the rare and very strange dynamics of stigmata. The heightened feeling-capacity is directed toward the universal archetype of suffering, represented in the figure of Christ. Given the all-consuming desire to unite with Christ, combined with the hysterical propensity to somatize, something like stigmata, which reproduce the wounds of Christ, seems like a possible course. However rare, the human sometimes rises to the passion of wanting to unite with the divine even if it costs the complete crucifixion of the human. This may sound slightly mad or dangerous or it may be read as an image being projected from some very deep region of the subliminal mind. One might be content to say that stigmata and other esoterica make a group of phenomena that in a broadly enticing way support some form of basic idealism, which I define as a philosophy anxious not to underrate the creative power of *ideas*.

In the early stages of his career, Padre Pio was accused of faking his stigmata, wearing perfume, and trysting with the ladies. Stories like this are amusing in Boccaccio's fictions, but the rumors about (the now) Saint Pio were refuted early on, although they still circulate on the Web and appear in books that don't like the Padre for one reason or another. Here, however, is a short list of some of the relevant facts concerning his stigmata. Essentially, they bled continuously for fifty years. Shortly before he died in 1968, the wounds gradually ceased bleeding and began to heal and disappear until the moment he died and the last scale fell away—

> On September 22, 1968, while Padre Pio was celebrating his last Mass, two almost perfectly white scales fell from his hands. On the morning of the 23rd, while Dr. Sala and I were preparing his lifeless body, the last scale fell from his left hand.[7]

The wounds on his side and feet (after fifty years) had also disappeared and left no scar or any trace. "Every deep and lasting injury resulting in lesions of the tissues leaves an easily seen scar," we are reminded. In all the years of their unexplained existence, Pio's wounds were never infected, enflamed, or suppurated, and in fact were known to emanate, as covered in Thurston's book, anomalous and inexplicable fragrances. Nor are Pio's stigmata associated with hysteria, typically found in female stigmatics. The chapter by Cruchon, who was Pio's physician, puts to rest the absurd claim that the wounds were self-inflicted. In this instance, later research confirmed that Thurston was on the right track in his early assessment of the stigmata of Padre Pio, as being authentic, unexplained, and rare but perhaps not (according to Thurston's understanding) *miraculous* (pp. 100–101). Whatever the use of miraculous language in a community of believers, from the present standpoint, stigmata are important because they exhibit a high degree of mental influence over physiological processes. Stigmata are evidence for a theoretically important type of psychophysical process that is probably latent in all human beings.

A related anomalous skin behavior is behind what Thurston calls (in Chapter III) "tokens of espousal." Books on hagiography are full of stories of miraculous rings that appear on the fingers of god-intoxicated women. This is how Thurston puts it: "In nearly all such cases the outward manifestation is preceded by an ecstasy in which the soul thus favored believes herself to have gone through some form of mystic espousal with Christ. . . ." (p. 131). Many deeply religious women have espoused their souls to Christ, but few return with rings on their fingers, or other tangible tokens of their espousal. There is the intermediate case of St. Catherine of Siena, who received a ring of espousal visible *only to her*. There were no physical signs of the ring, but the experience points to a novel possibility: a capacity for *selective permanent hallucination*. By means of this capacity she convinced herself that she was indeed spiritually espoused to Christ, whom she is free to imagine in some form, perhaps mediated by a local artist whose work impressed her imagination.

In other cases, the hallucination begins to materialize. The dream becomes visible in one's own body through ringlike growths and colorations that appear on the skin of the ecstatic's fingers. Dr. Imbert-Gourbeyre studied the case of Marie-Julie Jahenny, a stigmatic who was espoused in a vision. In 1894, he described what he observed: "Marie-Julie's ring remains to the present day. I saw it again in October, 1891, still a ring made in the fleshy tissues, like a hoop of red coral which had sunk into the skin" (p. 133). So the vision of espousal

can prompt a permanent hallucination or lead to the manipulation of the shape of skin cells and the flow of blood in conformity with a ring-idea, imagined with special intensity by certain young women. All this seems to take place apart from any known genetic or normal physiological function. Perhaps we could say that in line with recent changes in understanding the plasticity of the brain and the pleiotropic nature of genes,[8] our understanding of psychophysical relations is also being challenged. This entire discussion of the physical phenomena of mysticism and its empirical findings fly in the face of mainline assumptions about how mind and consciousness work.

Luminous Phenomena—One is tempted to stand this phenomenon side by side with levitation; the paranormal target once again is a basic physical reality: light. Light, the key to the discovery of the quantum domain, is also a fertile source of symbolic meanings, and figures in religious art in haloes, nimbuses, and aureoles. This is a short chapter packed with critical qualifications. Hagiography often speaks of supernatural luminosities that emanate from the bodies of spiritually favored persons,[9] but Thurston does his usual thing and tries to sift out the evidence for truly unexplained luminosities, though not before reviewing a case of a "luminous woman" of Pirano in 1934. Her phenomena were filmed and physicians from the University of Padua studied her; the physician there had a naturalistic explanation in terms of the physiology of excessive fasting and the religious ideas she was fixated on. Thurston also notes that Prosper Lambertini thought there were good naturalistic explanations for many unusual luminous phenomena; however, both Lambertini (the future Pope Benedict XIV) and Thurston conclude there is a residuum of cases much more difficult to explain away.

A laybrother, Jerome da Silva, had to deliver a message to Father Francis Suarez, the great Spanish theologian. As he approached Suarez's room he called but received no answer. "As the curtain which shut off his working room was drawn," Jerome writes, "I saw through the space left between the curtain and the jambs of the door a very great brightness. I pushed aside the curtain and entered the inner apartment. Then I perceived that a blinding light was coming from the crucifix, so intense that it was like the reflection of the sun from glass windows, and I felt that I could not remain looking at it without being completely dazzled. This light streamed from the crucifix upon the face and breast of Father Suarez, and in the brightness I saw him in a kneeling position in front of the crucifix, his head uncovered, his hands joined and his body in the air lifted five palms above the floor on a level with the table on which the crucifix stood" (p. 166). Agitated by the sight of all this, Brother Jerome left the scene. When Father Suarez discovered he had been observed in his curious state, he exacted a written promise from Jerome to record what he saw in writing but keep it unknown until after his death. Jerome was forced to consult with his confessor,

Father de Morales, about what had happened, thus adding a second person in a joint promise to thus keep the secret of what he observed. Thurston comments: "As both the laybrother da Silva and Father de Morales were themselves held in deep veneration for their well-known holiness of life, it seems to me that this is a piece of evidence which cannot lightly be rejected" (p. 166). One can see how witnesses of such events, and those who believe the reports of them, might be swept up into powerful states of religious belief. Experiences such as da Silva's call attention to what seems a good explanation of the origin of certain core religious beliefs and religious worldviews. As we secure a more accurate picture of the true powers of human consciousness, it should enable us to gain an altogether new perspective on the origins of religious belief. The new hermeneutics would neither preserve intact nor destroy traditional religious beliefs; it would, I believe, lay the groundwork for some novel re-imaginings of the nature of "religion" and "spirituality." But on to the next set of physical phenomena.

Marvels of Heat and Fire—Chapter VI is called "Human Salamanders." A salamander is a newtlike amphibian of the Order Urodela, but the term also refers to a mythical lizard or elemental that lives in or can withstand the effect of fire. This chapter then veers us back to the world of elementals, and tells of people who demonstrate immunity to fire. This involves several things: immunity to the pain inflicted and the injury of human flesh normally accomplished by fire. Even highly combustible materials like clothing are caught up in this immunity.

The chapter begins with the story of St. Polycarp of Smyrna who was condemned to die at the stake in 155 A.D, but around whom the flames, when ignited, perversely formed a harmless circle, driving his executioner to dispatch the saint with a lance through his breast. The author provides more recent examples of saints who qualify as "human salamanders," but Thurston runs into a difficulty. It appears that immunity to fire is well-attested in cases of mediumship and Spiritualism, D. D. Home having performed the marvel before credible witnesses. In addition, there is very good testimony to fire-walking ceremonies that involve different faiths. Finally, Thurston reviews fascinating cases of biologically endowed immunity to fire, illustrated by a professional fire-eater named Richardson and a black blacksmith from Maryland who could hold fiery molten iron in hand and drink boiling water. How would the neo-Darwinians explain the blacksmith's mutant talent? Thurston confesses puzzlement; if one can have this capacity naturally (without any spiritual connection), and if people of other faiths obtain the same astonishing effect, we do not seem to be dealing with something that only Our Biblical Deity could produce as a favor to his saints. It seems rather to be a capacity of people in any culture, as long as certain psychological states and attitudes are in play. We should study this because we might learn more deeply how fear limits what we can do or become.

As indicated, immunity to fire extends beyond immediate effects on flesh. One's hair and clothing and other personal appurtenances also escape destruction. This suggests that something is happening to entire volumes of space, in which all the objects within are shielded from the process of combustion. I also want to mention the social dimension of these occurrences; the immunity can be imparted from one who has it to one who does not. Home was quite good at handing over immunity, and had to be, as Thurston points out, as he often handed burning coals to his upper-class English lady admirers; it would have ruined his career if he set one of them on fire. If gifted people can infuse their gifts into other people directly, it might be of use to learn how it's done; it could be the basis of some new principle that we might apply to the art of teaching. Finally, an eyewitness report by a Catholic Bishop: A fire ceremony is conducted by a Muslim with an Indian population, during which hundreds are encouraged or held back from the walk. At the end of the ceremony, the Muslim collapses, a paranormal group process extraordinaire.

Thurston's saints and mystics have a gift for escaping the effects of fire; they can also generate fire from within themselves. They generate, according to Father Thurston, *Incendium Amoris*, the Fire of Love. As certain mystical women, already noted, experienced espousal with Christ, producing hallucinatory or psychosomatic rings on their fingers, in this chapter we find accounts of individuals, men and women, who are so ablaze with mystical love for their Image of the Divine that their bodies become physically burned, enflamed, wracked, desiccated, boiled, and all-round fired up. These ardors are often triggered by actual images of art, as was the case with Joseph of Copertino who was regularly jolted into ecstatic rapture by the sight of a mere painting, the *Madonna of the Grottella*, which he first saw in a small church in Copertino. These men and women are more than metaphorically on fire with mystical love. For when doctors took Padre Pio's temperature, the mercury would expand to the limit and the thermometer would shatter. Filipo Neri's heart pounded with such fury during his flights of adoration that he broke his own ribcage, whose bulge became visible to his confrères, and was publicly dissected during his autopsy. Magdalina de Pazzi could be seen on a winter's night frantically ripping her clothing off, consumed by real fires of mystical rapture.

Thurston seems to relish giving us the details of these strange ravagings of the spirit, but fails to ask how all this may relate to human sexuality. This not being the place to discuss this question, I recommend two books, one by George Bataille that discusses the erotic mysticism of Teresa of Avila, and the other by Jeffrey Kripal, which studies the homoerotic dimensions of Ramakrishna's mystical life.[10] One brief comment I cannot resist making: the *incendium amoris* is testimony to the extraordinary physical power of the imagination. There is no physical object of love there, at most a symbol, an idea, or a painted image; it

is the mental object—the mental process—that sets the body on fire and makes the blood boil, literally.

Suspension of Effects of Bodily Death—To sketch a typology of these charisms, we are thinking in terms of what piece of natural machinery has been stopped, diverted, or suspended. Four chapters are about phenomena that in different ways *delay, alter, or suspend the normal effects of bodily death*. One thinks of John Donne ending a famous sonnet with the apostrophe: "Death thou shalt die!" In each case, we observe some interference with events that normally supervene upon bodily death. They are called "The Odour of Sanctity," "Incorruption," "The Absence of Cadaveric Rigidity," and "Blood Prodigies."

The Odor of Sanctity—The chapter on "The Odour of Sanctity" begins with St. Polycarp, whom we met in the context of immunity to fire. Thurston writes "that already in the second century the idea was familiar throughout the Christian world that high virtue was in some cases miraculously associated with fragrance of body" (p. 223). In a well-authenticated letter, a witness to Polycarp's death wrote: "We perceived such a fragrant smell, as if it were the wafted odour of frankincense or some other precious spice" (p. 222). Since then much testimony on anomalous fragrance has been collected. Thurston associates it with death and tombs of saints but, based on his own examples, the living seem to produce unexplained fragrances as often as do the dead. Thurston is quick to note that the effect is found among spiritualists and mediums, for example, Stainton Moses, much admired by Frederic Myers. Thurston thinks the mediumistic effects minor by comparison with their saintly counterparts. The former involve an exaggeration or extension of actual scents of known sources, according to Thurston, whereas the odor of sanctity is typically of unknown origin and ineffable identity, with the effect being unambiguous and overwhelming.

As with all the charisms discussed in this book, they manifest in different ways and to different degrees. For example, the point of origin of Stainton Moses's fragrance could be traced to a particular moist spot on the top of his head (p. 225), and was associated with a pain he suffered, while Sister Maria della Croce's fragrance emanated from one of her fingers, following her mystic espousal to Jesus. The saintly odors, like the waxing and waning of stigmata, are more likely to manifest on holy days and during especially meaningful, that is, sacred times. Thus, after Communion, according to della Croce's biographer, Weber, an "indescribable sweetness . . . exuded not only from her body but also from her clothes long after she had ceased to wear them, from her straw mattress and from the objects in her room. It spread through the whole house and betrayed her comings and her goings and her every movement. . . . This phenomenon, which lasted for many years, was the more remarkable because naturally she could not endure any scent" (p. 229). Another variation to further

confound us is that these mysterious fragrances, powerfully evident to most percipients, were sometimes imperceptible to some. A detailed account of anomalous fragrance is discussed at length in Domenico Bernini's biography of Joseph of Copertino, where it is said that his cell was filled with unexplained fragrances years after his death, as well as were all manner of objects he had touched in life.

So what is going on here? Are the unearthly fragrances (as often dubbed) structured hallucinations involuntarily produced and perceived, or do they involve the materialization of physical particles that produce public olfactory impressions? The fact, repeatedly deposed by witnesses, that objects used or touched by the saints would continue to emanate odors, sometimes for years, speaks for a physical interpretation of the phenomenon. On the other hand, Padre Pio is said to have communicated his presence by projecting his fragrance to people across the Atlantic and Pacific oceans. This suggests partial bilocation or olfactory apparition or some mental form of communication, but I suppose the atoms could be teleported across the ocean!

We can only speculate as to what is going on at (say) the quantum level of the olfactory universe. What seems clear: The odor of sanctity is a highly symbolic and expressive way to convey a message, a heart-wrenching meaning and cri de coeur. In its various guises, this phenomenon—as I read it—wants to communicate a very important, very dramatic message. The symbolism of fragrance and incorruption suggest a definite idea. Suppose these phenomena are part of a language, and suppose the speaker is Some Higher Mind trying to communicate with us. The big message seems to be about death: instead of the stench of putrefaction, we get the fragrance of unearthliness; instead of the conqueror worm, we are given an icon of eternal life. "You see," the incorrupt body of a saint seems to say, "look at me! I performed the great experiment—look at my incorrupt body! What you see is a symbol, an earnest of things to come, not yet resurrection, but enough to *feel* the next dimension of reality."

Christian mystics assume survival of death, so Thurston's book is not concerned with survival evidence. However, in suspending the effects of bodily death, the afterlife question is posed indirectly. Stopping the entropy, staving off the rot of death, is more than a symbol; it is acting out on earth a power that would dare to take the sting out of death as conceived by rational, sensate man. The meaning—the image of triumph—of these death-dodging and death-delaying displays is clear enough. Bergson once remarked that the moment consciousness stumbled on the idea of death it instinctively reaffirmed the idea of immortality, for it had to maintain the forward trajectory of the life "impetus."[11] The phenomena that Thurston describes seem like data ("good news") that point toward bodily resurrection; this is data different from psychical research, which is about the interior life's survival. No conflict here.

The evidence of psychical research and the evidence for supernormal bodies converge; they form a basis for an expanded vision of the possible range and life potential of a human being.[12] The incorrupt saints offer a demonstration, not of consciousness surviving death, but of an unknown force that can demonstrably suspend the natural course of bodily death. Incorruption is an earnest[13] and sign of an unknown "resurrection" power.

Absence of — Thurston's chapter with the curious title "Absence of Cadaveric Rigidity" (or *rigor mortis*) continues with phenomena that actively and perversely deconstruct our most ingrained conception of bodily death. *Rigor mortis*, the iron rigidity that grips dead bodies, is checked, it is halted and kept at bay: And the moisture, and the suppleness, and the warmth of a living body are *retained*. Rebelliously and shockingly retained. Unnaturally and therefore it might appear supernaturally. It is as if these saintly figures were merely in a profound trance, or striking a pose, they looked poised for a great awakening. Undoubtedly uncanny, this is a phenomenon about as dramatic as can be, and as charged with the operatic heights of meaning. Absence of *rigor mortis* must be seen as an aspect of incorruption; if a dead body does not decompose, it should not surprise us if its limbs retain their suppleness. Thurston locates the earliest eyewitness report of cadaveric suppleness in 1260 (p. 272); a half-century later we have exact testimony of St. Francis's preternaturally limber cadaver. According to Brother Elias, he saw Francis lay dying, covered with the five wounds of Christ, bent over and unable to raise his head. His limbs

> were rigid as are wont to be the limbs of a dead man. But after his death, his countenance was most beautiful, gleaming with a wondrous brightness and making glad them that saw it; and the limbs which before were rigid had been made exceeding supple, allowing them to be turned hither and thither according to his position like the limbs of a tender boy. (p. 271)

What certainly sounds odd here is that the corpse of the saint *re-acquired* the suppleness of limb it had lost in life. The strength lies in the numerous cases, more spectacular and more thoroughly witnessed even until present times. The cases cited by Thurston confront us with a medical anomaly that has rarely been discussed or even acknowledged to exist. I mean cases in which dead bodies (after death) *gain* in freshness, brightness, fragrance, suppleness, and general aliveness. Thurston reminds us that, as with levitation, it should be easy to detect the absence of *rigor mortis*. A child, he avers, could be a good witness as to whether a limb is loose or stiff, a neck supple or rigid.

On a hot July day in 1912, a nun of Southern Italy, a Sister Maria della Passione died and was laid out to be viewed by the public.

> . . . the body remained throughout perfectly flexible, and although it was pulled about by the constant handling of those who stood close to it, to the astonish-

> ment of all, it remained without a trace of corruption and without giving off the least unpleasant odor; on the contrary it was remarked that the face became more and more beautiful and the features more clear-cut. (p. 273)

The latter observation is much too subjective to be taken seriously, but some cases discussed by Thurston seem harder to dismiss as mere illusion or imagination. We are told, for example, of a Carmelite nun of Tours who died in 1848 that "her limbs, though they had been stiff and immovable during her illness, became after death, as supple and flexible as those of a child" and of a laybrother from Viterbo who died at Rome in 1750 of gangrenous necrosis. The description of the biographer is very puzzling:

> Hardly had the corpse been laid out, when, as all could see for themselves, an incredibly surprising change took place in every part of the body. The blotches, the wounds, the unhealthy pallor and the other signs of the gangrene all disappeared at once; the flesh of the limbs became healthy, supple and white like that of a child; the knees unbent to their full extent, the hands and feet which were before contracted and knotted, straightened out and became pliable like those of a man in health. In fact, the body was completely transformed, and as all present perceived, it was not only changed in appearance, but also flexible and comely in a degree which excited general attention and astonishment. (p. 275)

There are yet more complex and richer cases discussed by Thurston, but let us proceed to our next phenomenon.

Blood Prodigies—Another chapter about dead people; to be sure, they are dead, but they do things that give the appearance of *being alive*. Thurston admits to not being at all sure how this phenomenon relates to mysticism, or whether it can be naturally explained, or what its spiritual significance may be; the last passage he quotes is one from a medical expert he hopes will put his doubts to rest (pp. 292–293). He felt driven to include a brief chapter because of the abundance of well-observed cases. When moved from one resting-place to another, or disinterred and medically examined, or surreptitiously attacked by relic hunters and had their toes, fingers, or whole limbs cut off, the often long-dead bodies of these mutilated saints have been observed to bleed—months or even years after death—warm, fresh, full-bodied crimson blood.

All in all, there is much toying here with the mechanics of bodily death. So we are bound to ask ourselves: What is one to make of these incorrupt, fragrant, warm, supple, bleeding, shiny-eyed, radiant *corpses*? If we allow ourselves to dwell on the effect of the overall image, it does seem as if our imagination of bodily death is being revised by images of eternal life triumphant over putrid death. There is no logical argument here; there is simply a visible manifestation of a power that presumes by its action a certain power to transcend death.

Chapter VII is about "Bodily Elongation." It also discusses stigmata and

inedia, and continues playing devil's advocate against the author's beliefs, by confronting the consequences of hypnosis being used to induce stigmata. About the observed phenomenon of the limbs of ecstatics becoming elongated, Thurston writes: "This is a prodigy which no devout client would be likely to invent in order to demonstrate the sanctity of the particular object of his veneration" (p. 193). The fact that mediums and hysterics were also known to display a knack for bodily elongation (as well as bodily shrinkage) led Thurston to doubt it should be thought of as anything supernatural. Thurston suspects that the physical phenomena may be preternatural or paranormal and worthy of wonder, but still an expression of the natural world and not a sign of divine intervention.

Thurston provides as usual a feast of highly particular, highly bizarre scenes in which hysterical ecstatics claiming to relive the crucifixion of Jesus display their bodies in wildly dramatic contortions in which limbs are elongated *and measured on the spot* and then shrunk back to their normal size. These are scenes from Lewis Carroll's "Wonderland," or scenes from the local madhouse, for, according to Thurston, the stigmatics are, however pious in their intentions, also hidebound in neuroticism.[14]

A revealing example is the case of a pious neurotic, Elizabeth, who had been in several *Kliniks* until she came under the care of Dr. Lechler. On Good Friday in 1932 she went to a movie that showed a scene of the crucifixion of Jesus in realistic detail. This disturbed her and when she went home felt pains in her hands and feet and called Dr. Lechler who hypnotized her, a procedure they sometimes found useful. The doctor suggested to the hypnotized woman that she was experiencing the wounds of Christ crucified; she responded to the suggestion, including a suggestion that her eyes bleed; the experiments were written up and published.

If Dr. Lechler could re-produce by mental suggestion the wounds of Christ in a pious neurotic, the whole phenomenon, however real and scientifically inexplicable, could not be classified as divinely wrought. So this chapter, while reviewing much provocative evidence of things possibly paranormal, contributes to the naturalization of the phenomena under discussion. Instead of making the case for the superior "stupendous" status of saintly phenomena, the very status of the phenomena *as saintly* seems in doubt.

Suspension of nutritional needs—If anything suggests a revolutionary break from the known order of biological nature, it is the phenomenon of living without eating, drinking, or eliminating. Thurston has three interrelated chapters on this topic of supernormal nutrition, XV ("The Mystic as Hunger-Striker), XVI ("Living Without Eating"), and XVII (" Multiplication of Food"). As usual, Thurston presents concrete examples, weeding out the best cases for prolonged inedia, and considering counter-explanations.

Thurston is forced by the data to a qualified conclusion: There is good evidence that people other than Catholic saints are long-standing inediacs. For example, there are cases of physically handicapped subjects who live without eating or drinking or eliminating; but, if it can be naturally achieved, it is not a miracle. Like Prosper Lambertini, Thurston does not grant supernatural significance to inedia as such while at the same time he gives detailed lists and accounts of highly functional saints and their super-prolonged fasts.

Related to transcendence of terrestrial nutrition, Thurston has a short chapter on "the multiplication of food"—one of the more famous miracles in the *New Testament*. The strange thing about the multiplication of food stories is that the miracle likes to hide; no one ever sees a loaf of bread or glass of wine materialize out of nothing. There is always a small supply of wine, a small basket with a few fish or a few pieces of bread; but somehow everybody ends up eating enough so that they can share with others and still have leftovers.

The ability to live without normal nutrition seems a latent, albeit rarely witnessed, human capacity. It can emerge in a subject in perfect health or in someone grossly impaired, physically or emotionally. Or it can be accomplished willfully, as part of a yogic discipline. Transcending the need for nutrition from the sublunary world, we may imagine combining the ecstatic power over gravity that produces levitation. A picture begins to emerge of a self-nourishing and self-propelling being, as if we were glimpsing the outline of a super-physical organism, pre-adapted to wider environments of being, a world of inner spaces with their own various geometries. It is almost as if the subliminal intelligence orchestrating our transcendent talents wants to help us imagine what it feels like to be ready to embark on some great adventure.

Chapters XIII and XIV contain material that cause Thurston to doubt if the boundaries between natural and supernatural can be sharply drawn. Inedia can occur with a paralyzed sick person, a mere abnormality; but it can also occur in an otherwise fully functional organism as that of Theresa Neumann. Is inedia proof of untapped human potential or of divine intervention? This was an important question for Thurston who was a priest in the Catholic Church. Inedia seems to occur in a variety of contexts, some we might call diseased, others religious, and others a mixture of spirituality and pathology. The data suggest something about latent resources for certain life functions, perhaps a kind of biological force that the physicist William Crookes was convinced he had discovered in his experiments with D. D. Home.[15]

Chapter XIII, which covers "The Case of Mollie Fancher," is long, and problematic for Thurston. After two crippling accidents, Mollie Fancher, born in 1848, acquired extraordinary paranormal powers. The problem for Thurston was that Mollie, highly intelligent and articulate, in no way qualified as a Christian believer; her remarkable capacities, comparable to charisms of

great saints, could not be explained by Thurston's theology; once again the phenomena of the saints were turning up in outside contexts. This seemed to cast doubt on the entire belief system he was using to assess the miraculous status of his phenomena. Mollie seems to have been able to live without eating for years, see through parts of her body other than her blind eyes, enjoy a wide range of clairvoyant awareness of her environment, and converse regularly with the ghosts of her deceased relatives. She did all these things in a private, discreet, and religiously neutral manner. At times during her career, alternate personalities, four of them in fact, emerged, took over, and displayed distinctive traits. Her extraordinary behaviors were observable, they were tested, and they were attested to: by select friends, by family, by several doctors, and by her chosen spiritual companions. She lived bedridden for thirty years in her aunt's house in Brooklyn, New York. The eyewitness testimonies are collected in a volume (1893), *Mollie Fancher, the Brooklyn Enigma*, by Judge Abram H. Dailey.

After Mollie Fancher, there is a followup chapter, "More Seeing Without Eyes": three more cases involving the transposition of senses. Mrs. Croad, an English contemporary of Mollie, after a bad spinal injury became totally blind, deaf, and speechless; cut off from the world around her, she lived with limited sensation and restricted mobility of limbs. In this behaviorally near-death state, Dr. Davey reports that Mrs. Croad was able to "see" through her fingertips; Davey concluded: "The various tests . . . were witnessed by Drs. Andrews and Elliot in my presence, with the effect of assuring us that she (Mrs. Croad) was and is able to perceive, through the aid only of touch, the various objects, both large and small, on any given card or photograph" (p. 328). Mrs. Croad, like Mollie, also acted as if she were in direct clairvoyant rapport with familiar excarnates. Mrs. Croad was not a Catholic saint, and neither were the two Italian girls discussed by Lombroso; nor were the many other victims of trauma who were left with unexplained supernormal cognitive and fasting powers. We seem to be discussing a natural phenomenon, which may appear both in pathological or deeply mystical contexts of human behavior.

Thurston concludes by underscoring the difficulty he found in trying to separate the "abnormal" from the "miraculous or supernatural." Using a less question-begging taxonomy, Myers distinguished "evolutive" and "dissolutive" types of phenomena. Some things bear fruit for the future; other sow seeds of decay or ruin. The contrast has no absolute sanction or meaning. There must be an infinity of ways events can be "evolutive" and "dissolutive" for each of us. Moreover, the way we understand *evolutive* and *dissolutive* is not at all clear or obvious. The most that we can say is that what one makes of an encounter with something shockingly transcendent is always in some sense a creative act. On Thurston's own weighing of evidences, it is hard to sharply separate phenomena

of saints from phenomena of mediums and some hysterics. In all cases we are talking about experiences mediated by a fallible human consciousness.

Conclusions

Taking a tip from William James, we have looked at some of the more extreme psychophysical phenomena reported in Thurston's book—phenomena connected with mystical practice. As to Thurston's belief that the saintly marvels he describes are more "stupendous" than comparable phenomena of spiritualism and psychical research, a case could be made using levitation as a possible example. Also to their credit, the mystics introduce new forms of "miracle," such as stigmata, the telekinetic Host, "rings" of divine espousal, and some baffling antics on the *rigor mortis* front. On the other hand, Thurston argues that many of the phenomena he covers may just be paranormal or abnormal in a purely naturalistic sense and are not therefore signs of divine favor. Thurston provides good reasons to take a more catholic than strictly Catholic view of the miracles recorded in the annals of sainthood.

The Church takes a legalistic view of its various ratification processes, of deposing and assessing testimony, thus leaving for public study evidence for miracle claims in the course of centuries. I would think that if a tradition of deposing eyewitness testimony were part of all the world's systems of religious salvation, we would have a vast database of enormous interest to researchers curious about the paranormal origins of religion and the outer edges of human consciousness and capacity. One thing is at least clear: some form of ascetic self-mastery is valued in all the spiritual traditions. The extreme fasting found among Catholic mystics is also found among native North American Indians, and for the same reason, as a way to prepare for receiving grace, a gift of psychical power, or a Myers-like "subliminal uprush." Whatever the differences in conception, language, or mythology, we find technologies of transcendence based on ascetic self-mastery. The general aim of ascetic practice is to stop the mechanical, self-obscuring flow of routine sensori-motor life. In effect, this isolates and magnifies the power of consciousness by deflecting it from its routine service to the brain and making itself radically available to the subliminal self.

The Catholic ecstatic tradition is rich in wisdom lore and paranormal phenomena. It looks like saintly manifestors of these phenomena are acting out their belief-systems, transforming their beliefs into sensory signs and active self-manifestation. The ecstatic so identifies with the Christ figure that she reproduces the archetypal wounds in her own body, making her identity with the divine figure tangible and brutally self-evident. These gestures might be thought of as new forms of rhetorical *epideixus*. Or, along the same lines, the saint apes the creator God by multiplying food or defying the law of gravity or

transcending the physiology of nutrition. All this may be seen as acting out the Biblical statement in the *Book of Genesis* that man is made in the image of God; in other words, by underscoring our likeness to the divine we learn to perform divine acts. Piecing the different phenomena together, looking at them in terms of what they enable us to do, a picture begins to emerge of a possible (call it) hyper-human, an emergent new form of life; if you like, a theoretical image of a resurrected, evolved, transformed specimen of humanity. (An evolutionary idea long ago intuited by mystics and prophets.) The data, in short, seem to want us to believe that we are part of a great metaphysical drama of transformation and liberation, a real adventure ahead, both futuristic and evolutionary.

But this undoubtedly weird data of Father Thurston's might also be useful as a tool of interpretive power with regard to the past. The material covered in Thurston's book should interest academics curious about the origins of religion; for one thing, it's loaded with curious facts absolutely central to discussing the ontology (nasty word) of certain religious claims. The overwhelming trend of modern science and all the rest has been to deflate the ontological status of spirituality; to think of it as hand-waving, self-deception, a hang-over from the childhood of the race, or, thanks to Freud, inspired by neurotic wish-fulfilling. Obviously, this is not my approach. On the contrary, in light of the physical phenomena of mysticism, I feel rationally bound to affirm some broadly conceived transcendent factor at work in nature.

I find myself reflecting on something else about Thurston's data: a point that at least for me opens up new avenues of exploration. The particular historical shape these effects assume are bound by time (heightened in the 16th and 17th centuries), by place (Latin European), and by culture (Catholic). Some effects described are reported nowhere else; the type, range, and extent of paranormal effects, in this case, are tied to particular cultures, historical epochs, specific symbols, and belief-systems. This seems true, for example, of Baroque Europe, which produced so many extreme and interesting ecstatics (Joseph Copertino and Teresa Avila) and their mystical and physical phenomena. What was happening in the Baroque Catholic Reformation that contributed to the development of these singular results? It was a period of high anxiety, and the medieval psychic mold was breaking up. Much of this turbulence was reflected in Baroque art, and one line of inquiry might be the influence of baroque art on psychic phenomena, the role of images, the psychic power of divine figures floating, plunging, or ascending in recessed, fantastic spaces, along with Loyola's injunction to breathe extravagant sensory life into metaphysical abstractions, illustrated perhaps by Bernini's statue of Saint Teresa in ecstasy.

In the field of psychical research, much work has been done on psi-conducive personalities, and psi-conducive personal variables such as belief, lability, and spontaneity. Thurston's book suggests that we might explore

psi-conducive epochs, psi-conducive cultures, art-styles, religions, diets, and indeed a whole range of variables that may retard or liberate the expression of higher orders of conscious experience.

Notes

[1] *Surprising Mystics,* Chicago: Henry Regnery Company, 1955, and *Ghosts and Poltergeists*, Fort Collins, CO: Roman Catholic Books, 1953.

[2] See C. Flammarion, *Mysterious Psychic Forces*, Cambridge, MA: The University Press, 1907.

[3] E. A. Peers, *The Autobiography of St. Teresa of Avila*, Garden City, NY: Image Books, 1960 (translation).

[4] Pastrovicchi, A., *Saint Joseph of Copertino*, Rockford, IL: Tan Books, 1980.

[5] He notes that Prosper Lambertini virtually ignores the phenomenon in his major work on beatification and canonization.

[6] Ruffin, B., *Padre Pio: The True Story*, Huntington, Indiana: Our Sunday Visitor, 1982.

[7] Cruchon, G., "Padre Pio's stigmata," *Padre Pio of Pietrelcina: Spirituality Series I,* San Giovanni Rotundo, 1972, pp. 110–141.

[8] See Fodor, J., & Piattelli-Palmarini, M., *What Darwin Got Wrong*, New York: Farrar, Straus and Giroux, 2010, pp. 44–46.

[9] See James, W., *Varieties of Religious Experience,* New York: The Modern Library:

> There is one form of sensory automatism which possibly deserves special notice on account of its frequency. I refer to hallucinatory or pseudo-hallucinatory luminous phenomena, photisms . . . . Saint Paul's blinding heavenly vision seems to have been a phenomenon of this sort; so does Constantine's cross in the sky. (p. 276)

[10] Bataille, G., *Eroticism: Death & Sensuality,* City Lights Books: San Francisco, 1986; Kripal, J., *Kali's Child: The Mystical and the Erotic in the Life and Teachings of Ramakrishna,* Chicago: University of Chicago Press, 1995.

[11] Bergson, H., *The Two Sources of Morality and Religion,* New York: Random House, 1932.

[12] Michael Murphy's *Future of the Body* (1992) contains a detailed discussion of all the phenomena in Thurston's book, and sees them as part of a vast story of the evolutionary future of the body.

[13] See Patrick Sherry, *Spirit, Saints, & Immortality*, Albany: State University of NewYork Press, 1984. This book explores the connection between the charismatic phenomena of the saints and life after death, i.e. "immortality."

[14] "I have not yet met with a single case of stigmatization in a subject who was previously free from neurotic symptoms" (p. 203).

[15] For a useful examination of Home's physical mediumship, see Braude, S., *The Limits of Influence,* New York: Routledge & Kegan Paul, 1986, pp. 70–108.

Michael Grosso
Division of Perceptual Studies, University of Virginia
Charlottesville, VA 22902 USA
gross.michael@gmail.com

Journal of Scientific Exploration, Vol. 25, No. 1, pp. 153–191, 2011 0892-3310/11

BOOK REVIEWS

Evidence of the Afterlife: The Science of Near-Death Experiences by Jeffrey Long with Paul Perry. HarperOne, 2011. 224 pp. $14.99. ISBN 9780061452574.

All of us who have longed to answer the question "What happens when we die?" will be enlightened by reading the new book by Jeffrey Long, M.D., with Mr. Paul Perry, *Evidence of The Afterlife: The Science of Near-Death Experiences*. This book is one of a few which answers this question from more than an anecdotal basis, but from the perspective of a scientific investigation by those trained in the scientific method.

As a resident in medical training, Dr. Long was guided toward learning about NDE in the prestigious medical journal the *Journal of the American Medical Association* while looking for an article on cancer. Several years later, a friend's wife recounted her NDE, spurring his interest. A decade passed until The Near Death Experience Research Foundation was organized by Dr. Long, with a dedicated website, http://www.NDERF.org, to scientifically investigate the phenomenon of NDE. By means of a painstakingly designed questionnaire, reports of NDE were collected from more than 1,300 respondents who answered more than 100 carefully designed questions. Dr. Long was satisfyingly amazed to see that more than 95% of respondents felt their experience to be "definitely real." What also came through, as seen in the work of researchers Moody, van Lommel, and others, was that descriptions of "loving grace" and "truth of love" were the messages that NDErs came back to tell us.

Dr. Long, born into a family of science, sticks to the scientific principle that "what is real, is consistently seen among many different observations." By doing so, and as a result of his compilation and analysis, he concludes that NDEs are "a spiritual thread that binds us together." It is this common thread of NDE, Long believes, that allows us to understand what happens after the death of the physical body, and that the NINE LINES OF EVIDENCE, as developed in his book, confirm the persistence of consciousness.

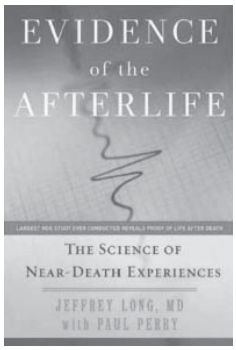
What does it mean to be "near death"? Long and Perry, I believe, have it right when they opine that "Individuals are near-death when so physically compromised that they would die if their condition did not improve." This is simple, concise, and cannot be disagreed with. His study deals with cases of unconsciousness, often in those thought to be "clinically dead" with the absence of spontaneous cardiac activity or respiratory efforts. The accounts studied are lucid, rather than fragmentary. In this book, more than 1,300 respondents,

613 sequential NDErs who completed the most recent version of his survey, and who responded to 16 especially designed SCALE QUESTIONS—which differentiate between valid and invalid NDE reports—are presented.

The experiences that NDErs have in common, report many, but not all, the following essential NDE components:

1) Consciousness separating from the physical body—reported by 75.4%.
2) Heightened senses—reported by 74.4% and often described as "crystal clarity," and perhaps feeling of being one with all, and a feeling of a much greater than normal alertness.
3) Generally Positive Emotions/Feelings—reported by 76.2% and described as incredible peace or pleasantness. 52.5% called it a feeling of incredible joy.
4) Travel through a tunnel—33.8% reported this experience. It is interesting, that a tyro in the field of NDE research will often cite the tunnel as a main feature of NDE, but the tunnel appears to be cultural in nature. In America, the incidence is felt to be higher because of our exposure to Western architecture, which often involves tubes, tunnels, and the like.
5) Mystical or Brilliant Light—64.5% of Dr. Long's study respondents experienced "the Light." This was described as pure, brilliant, but not causing discomfort.
6) Other Beings (mainly deceased relatives)—57.3% described the feeling of being part of a "soul family," often seen but for the most part sensed as being present. The deceased encountered favored family members over friends. The meetings were associated with feelings of love, joy, and being back in touch again.
7) Alteration of Time/Space was described by 60.5% with 33.9% describing time somehow speeding up. Often, strange dream-like alterations of space and time were described, a verification of Einstein's statement that the past, present, and future, coexist.
8) Panoramic Life Review—reported by 22.2% For me, this has always been an interesting aspect of the NDE when it occurs, and, as described by Dr. Raymond Moody and others, often experienced by those in attendance (Shared Death Experience) as well. It consists of a 3D panoramic display of one's life events in which one feels the pain inflicted and the emotional turmoil as a result of one's actions.
9) Unworldly or Heavenly Realms—40.6% were able to say that they visited such distinctive locations such as bright cities, beautiful landscapes, and so forth along with the sound of a music that just cannot be described in words.
10) Learning Special Knowledge—reported by 56% who seemed to understand a special purpose or universal order. 31.5% understood everything, during the moment, about the universe, and 31.3% understood everything about themselves and others.
11) Boundary or Barrier—31% reached a limiting physical structure. They could go no further, not being allowed to cross the boundary.
12) Return to the Body—100% returned, sometimes voluntary, sometimes forced to return. Dr. Long and Mr. Perry state that the best evidence for under-

> standing what happens when we die would come from people who experienced what we call clinical death, and returned to tell us of their travels.



The book is full of exciting stories and accounts of those who have peeked beyond the veil.

I urge all who desire to answer the question of persistence of consciousness beyond the death of the physical body, to add this book to his or her bookshelf. Prior to your first reading, take the test of your belief in an afterlife, by going to http://www.nderf.org/afterlife. Compare the results to repeating the test after reading the book. You will be amazed to see how far you have come to an understanding of the process we refer to as death, and the belief in what many call The Afterlife.

John L. Turner
Author of Medicine, Miracles and Manifestations: A Doctor's Journey through Worlds of Divine Intervention, Near-Death Experiences, and Universal Energy
Hilo, Hawaii
Doctor@JohnLTurner.com

Evidence of the Afterlife: The Science of Near-Death Experiences by Jeffrey Long with Paul Perry. HarperOne, 2010, 224 pp., $25.99 (hardcover), ISBN 9780061452550; HarperOne, 2011, 256 pp., $14.99 (paperback), 9780061452574.

Evidence of the Afterlife: The Science of Near-Death Experiences, authored by Jeffrey Long with Paul Perry, seems to be an attempt to present "proof" of near-death experiences (NDEs) as a result of research data collected over several years via Dr. Long's website, the Near Death Experience Research Foundation. Dr. Long's website included a detailed questionnaire that aimed to collect data from near-death experiencers (NDErs) in which they were encouraged to answer several questions about their NDEs, as well as complete the NDE Scale (Greyson, 1983), an instrument designed to determine if a respondent's reported experience could be defined as an NDE. Dr. Long is quite adamant in his assertion that this book presents the results of a scientifically rigorous and seemingly bullet-proof study. In principle, I agree with Dr. Long: Research involving transpersonal experiences, such as NDEs, demands methodological rigor and integrity (Foster, James, & Holden, 2009).

And thus begins the major problem with this book: The cover claims that the book contains research data that "reveals proof of life after death." This

claim is followed up in the Introduction with overblown assertions by the authors that this study followed "basic scientific principle[s]" (p. 3). I consider these to be overblown assertions because the authors appeared to overlook the most basic scientific principle: Scientific research will never produce "proof" of any phenomena. Yet, Dr. Long reports that his study's findings supported nine different "proofs" of an afterlife. Based on my careful consideration of the results in this book, the most that can be said about these categories of evidence is that NDErs in Dr. Long's study consistently reported nine major themes or features of their NDEs. These results are far from "groundbreaking" (p. 52) as the authors argued. These features of NDEs have been presented in many other reviews of the topic (see Holden, Greyson, & James, 2009).

As a whole, the authors did not seem to have a concrete grasp of who they wanted as their audience. The content of the book contained some academic language, particularly when Dr. Long described the methodology he used for his data collection procedures. However, the style of writing also seemed to drift into language directed toward a general, non-academic reader.

Because the book was largely a report of a research study, I expected Dr. Long to detail his methodology and statistical results to a greater degree than what he included in the book. He did report some details of his methodology, but few details of the actual statistical findings. It is a major problem to report results of a study without presenting the actual quantitative data.

Despite this book's numerous flaws, however, I found the many narrative reports from NDErs included to have great value. Dr. Long did collect an enormous amount of data; I believe the most valuable contribution his study has is simply some of the narrative responses NDErs reported on his website. Dr. Long accurately notes that such a large amount of published anecdotal and case study evidence regarding NDErs' reported experiences is difficult to locate. This book, and I imagine the NDEr reports that Dr. Long did not have enough room to publish within this text, include an important collection of narratives.

If the readers of *JSE* decide to purchase and read this book, I recommend doing so with a good dose of healthy skepticism toward the authors' claims of the overall significance of their text. For scholars, better resources exist that present a more balanced view of research on NDEs. For a general audience, this book was a quick read and, although it did not present anything new regarding NDEs, included some interesting reports by the people who matter most in the field of NDEs: near-death experiencers themselves.

Ryan D. Foster
Department of Counseling, Texas A&M University–Commerce
Commerce, Texas, USA
ryanfosterlpc@gmail.com

References

Foster, R. D., James, D., & Holden, J. M. (2009). Practical applications of research on near-death experiences. In J. M. Holden, B. Greyson, & D. James (Eds.), *The Handbook of Near-Death Experiences: Thirty Years of Investigation,* pp. 235–258, Santa Barbara, CA: Praeger/ABC–CLIO.

Greyson, B. (1983). The Near-Death Experience Scale: Construction, reliability, and validity. *Journal of Nervous and Mental Disease, 171,* 363–375.

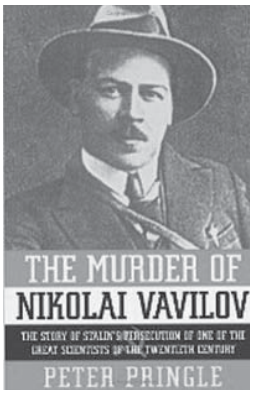
Holden, J. M., Greyson, B., & James, D. (Eds.). (2009). *The Handbook of Near-Death Experiences: Thirty Years of Investigation.* Santa Barbara, CA: Praeger/ABC–CLIO.

The Murder of Nikolai Vavilov: The Story of Stalin's Persecution of One of the Great Scientists of the Twentieth Century by Peter Pringle. New York: Simon and Schuster, 2008. xii + 370 pp. $26 (hardcover). ISBN 9780743264983.

This book by Peter Pringle—the former Moscow bureau chief for the British newspaper *The Independent* during the collapse of the USSR—is an original, important, and compelling account of the life of Nikolai Vavilov (1887–1943), one of the most innovative geneticists in history. Pringle's excellent book is the first full-length biography of Vavilov published in English, and is exceedingly well-researched; Pringle's sources included government records, family papers, first-person interviews, and Vavilov's remaining files and correspondence. However, *The Murder of Nikolai Vavilov* is more than an excellent scholarly book; it's also a moving book about science, politics, love, and war that you will not forget.

Vavilov was born into a wealthy family, and became interested in Mendelian genetics soon after he enrolled in 1906 in the progressive Petrovskaya Agricultural Academy. While at the academy, Vavilov began using genetic selection as a way of improving crops as part of his commitment to "work for the benefit of the poor" and the "enslaved class of my country." During a subsequent visit to Britain, Vavilov met William Bateson, who coined the term *genetics* and wrote the first genetics book (*Mendel's Principles of Heredity*, which was published in 1909). Vavilov was convinced that Mendel's work was the foundation for improving crops. By the time Vavilov produced his *Law of Homologous Series in Variation* (1920), which claimed that traits occur similarly in the various evolutionary stages of related species, his work was being recognized with awards such as the Order of Lenin. However, by 1930, Vavilov was mired in administrative work ("these layers of rubbish on all sides"), at one point holding 18 different positions (e.g., Director of the Institute of Genetics of the USSR Academy of Science).

Vavilov understood that genetic variability is important for improving



crop production, and he correctly concluded that the greatest amounts of variability would be found in a crop's "center of origin"—that is, where the crop was originally domesticated. To find and document this variability, Vavilov organized more than 100 expeditions through more than 60 countries to collect seeds of progenitor species and undomesticated strains unavailable in Russia. His first plant-hunting trip to find the genetic birthplace of the foods we eat—in 1916 to the Pamir Mountains—convinced Vavilov that he was on the right track. During this and subsequent trips, Vavilov endured much hardship, but he was successful—his "World Collection" of more than 250,000 seeds of cultivated plants and their varieties (from five continents) was the most extensive collection in the world. In the 1930s, Vavilov's institute distributed millions of packages of seeds and helped begin the production of more than 250 new varieties of plants. Vavilov's *The Centers of Origin of Cultivated Plants* (1926) remains a classic.

There was a clear urgency to Vavilov's work—"Life is short, we must hurry" was a favorite, if not prophetic, phrase. Vavilov had been Theodosius Dobzhansky's mentor, and Vavilov pleaded for Dobzhansky to return to Russia from California (where Dobzhansky was working with Thomas Hunt Morgan) to help him "lift the country" in a "mission for all humanity." Dobzhansky stayed in California.

The Murder of Nikolai Vavilov is an important reminder of the high costs incurred by individuals and society when leaders allow science to be perverted by politics and ideology. The bourgeois, well-dressed Vavilov had been supported by Lenin, but he began to fall out of favor when Stalin became leader. Stalin favored Trofim Lysenko, who used neo-Lamarckism as an ideologic basis for promises of immediate improvements in crop yields. Lysenko—whom *Pravda* described as a "barefoot scientist"—claimed that he could direct heredity and denounced Mendel's work as "rubbish and falsehood," telling Vavilov "I do not recognize Mendelism."

Not surprisingly, Lysenko's use of Lamarckism to improve crop-yields failed, and the USSR soon needed a scapegoat for its food shortages. Vavilov, unable to meet Stalin's demands for immediate results, was arrested in August, 1940, while collecting plants in the Ukraine and was taken by the Soviet secret police to Moscow. He was prosecuted on trumped-up charges for sabotage and spying (e.g., "Treason to the Motherland," "wreckage" of the economy). Following more than 1,700 hours of interrogation over 11 months, Vavilov was sentenced to death by firing squad, but that sentence was later commuted to 20

years in prison. Sadly, this commutation remained a death sentence, for while in a Saratov prison, Vavilov—the man who had hoped to use genetics to feed the world—was starved to death.

The Murder of Nikolai Vavilov is fascinating, thoughtful, and at times horribly sad. You'll pause when you read that Yelena Barulina—Vavilov's lover, companion, and former student—unknowingly took up residence only a few miles from where Vavliov was imprisoned; you'll be angered when you read that Vavilov succeeded in bringing Georgy Karpechenko and other colleagues back to the USSR, after which they were arrested and executed; and you'll be moved when you read about how workers at Vavilov's Leningrad Institute protected their precious seeds during the German siege, despite the fact that they were starving.

In 1955, a branch of the USSR Supreme Court overturned Vavilov's conviction, and in 1968 the Research Institute of Plant Industry (which Vavilov headed from 1921–1940) was renamed the N. I. Vavilov Institute of Plant Industry. Vavilov's World Collection in St. Petersburg, Russia, remains an important resource for conservation biologists.

Randy Moore
H. T. Morse-Alumni Distinguished Teaching Professor
Biology Program, University of Minnesota, MCB 3-104
420 Washington Avenue SE, Minneapolis, MN 55455
RMoore@umn.edu

The Discovery of the Sasquatch: Reconciling Culture, History, and Science in the Discovery Process by John A. Bindernagel. Beachcomber Books, 2010. 325 pp. $49 (paperback). ISBN 97800668288719.

As anyone with more than a passing interest in the subject knows, of the many books addressing the sasquatch phenomenon, few have been written by Ph.D.s, much less Ph.D.s who accept the possibility of a species of great ape inhabiting North America. So it was with great anticipation that I looked forward to the release of one of those rare tomes, written in this case by wildlife biologist John Bindernagel, a man of unimpeachable character and exemplary qualifications. Bindernagel, who received his doctorate from the University of Wisconsin–Madison, conducted wildlife research for the United Nations for twenty years, and currently lives in British Columbia.

The first thing I noticed was the back of the book featuring testimonials from noted primatologists Jane Goodall, Vernon Reynolds, and George Schaller, along with sasquatch research mainstays Jeff Meldrum and John

Green. The names of some of the other individuals cited elsewhere in the book for involvement as reviewers, contributors, etc., caught me off guard, knowing their preference for anonymity regarding an interest in sasquatch research. Perhaps this willingness to be identified with *Discovery* reflects the admiration many have for the author.

The six-page Foreword, written by Leila Hadj-Chikh, Ph.D., was a pleasant surprise; I thought she did a commendable job. Notably, Hadj-Chikh candidly aligns herself with the small number of scientists who "regard [the sasquatch] as a biological reality." I have to wonder what effect, if any, Bindernagel's book had on her decision to identify herself in this way—if it helped her to see herself from a historical perspective as a player in the often-sluggish process of shifting paradigms (if I may employ an overused expression). In any event, it seems likely, from reading the Acknowledgements, that Hadj-Chikh, who earned her doctorate in Ecology and Evolutionary Biology at Princeton, worked closely with Bindernagel and contributed to the development of his ideas.

The book is laid out in six parts. Titles of the twenty-one chapters and comprehensive outlines of content, along with chapter summaries, are available online and need not be repeated here. I have intentionally avoided reading the chapter summaries so as not to influence my comments. http://www.beachcomberbooks.com/discovery/contents.html

Part I, in two very brief chapters, summarizes the conventional perspectives long employed by historians and scientists from various fields regarding references to sasquatch-like creatures. The second chapter, one of my favorites, concisely describes the "discovery" quandary in a way every scientist should appreciate. While I would have preferred the inclusion at this point of some examples from the history of science pertaining to the difficulties produced by new discoveries (Hadj-Chikh discusses one example in the Foreword, and other examples are touched on in later chapters), I believe the decision not to do so was probably calculated, based on his intended readership, members of the scientific community, who we can safely presume are familiar with pertinent examples from their own fields of study.

As indicated by Dr. Bindernagel in prior correspondence, from the outset *Discovery* sets a decidedly academic tone, as opposed to something geared to the general public. His clear objective is to set forth and contrast the often-conflicting ideals and mores influencing the scientific community, specifically as regards the tension created between philosophical perspectives versus societal conventions upon the presentation or consideration of ideas that lie outside of accepted views. I think it is important to keep these distinctions in mind as one considers the book's content and the author's approach to the subject.

In Part II categories of evidence are presented. Bindernagel does not attempt a comprehensive review of every conceivable aspect of sasquatch lore,

sightings, biology, etc. Rather, he puts forth specific classic arguments employed by scientists to dismiss the possible existence of a North American ape, and then marshals sets of particulars, examples of significant evidence, or even single examples, to counter the objections. Anyone marginally familiar with the wealth of sasquatch-related information available online and in numerous books on the subject will realize that Bindernagel could have been written volumes regarding categories of evidence, but that was not his purpose. This is not to suggest that *Discovery* is merely a thinly redirected rehash of currently available lore. I think it likely that interesting and delightful nuggets of new (or at least unfamiliar) evidence, compelling ideas and arguments, and little-known information await discovery by the reader, scientist, and jaded sasquatch investigator alike.

There are, however, a few hitches as well.

In Chapter 5 of Part II, Bindernagel briefly delves into the evidentiary category of recent accounts. Surprisingly, this chapter was a disappointment to me. A handful of Canadian reports, deemed by Bindernagel to be credible and representing detailed extended observations, are presented, along with a description of Canadian journalist John Green's database. Unfortunately, the whole of North American sightings is displayed in a political map indicating, by means of shading, the general distribution of sightings (for Canada and the U.S.). It is dreadfully outdated and misleading.

The distribution of reports figure caption states that "2002 data" were used; presumably this means sighting reports were used from the years preceding and including 2002. Certainly more recent data are available from sources every bit as reliable as those compiled by John Green. Updating the data, which I hope to see in the next edition of the book, is a definite need. As it is, one would have to conclude that more sasquatch reports originate from, say, Oklahoma, where I live, than Texas, which is definitely not the case, or the figure could be interpreted as indicating that Ohio is comparable to British Columbia and the Pacific Coast states in terms of habitat quality or sasquatch distribution.

Ideally, I would also hope to see a more physiognomic approach to mapping sighting distributions in the next edition. This would better serve to illustrate the strong correlations that exist between sasquatch sightings and ecological factors. While Bindernagel does discuss such relationships, the use of a political map to indicate distribution produces the erroneous impression that sasquatch sightings are evenly distributed across Texas and Oklahoma, to use a familiar example, when in fact something like 90% or more of the

sightings originate in the far eastern margins of those states where rainfall and forest cover is greatest (and human populations are low). See the Texas Bigfoot Research Conservancy's "Report Explorer" for an excellent presentation of the non-random distribution of sasquatch sightings. Similar relationships exist for many other states. http://www.texasbigfoot.org/explorer/

In discussing the reports distribution map (Figure 5.5), Bindernagel makes an odd statement: "Western states and provinces are recognized as supporting large populations of certain large mammals, especially grizzly bears, but also ungulates such as elk. . . . " Perhaps this is a typographical error that can be corrected in the next edition. Certainly black bears are common and widespread, but the same cannot be said for grizzly bears, whose range is a tiny fraction of what it was a century ago, and whose disjunct population in the forty-eight conterminous states numbers in the hundreds.

In Chapter 6 the author discusses tracks and other physical evidence. I thought the track-related material was very good, but the rest of the material in the chapter contributed little of value, in my opinion, with regard to the objective of convincing skeptical or even open-minded scientists that evidence worthy of consideration exists or has been documented.

The tree twist evidence, for example, illustrated with six photos in Chapter 6, is disputable at best, and may only serve to further encourage amateur investigators to focus on this supposed sign of activity. Curiously, the most compelling artifact that I know of indicating a sapling possibly twisted by a sasquatch was only described in the Notes section at the end of the book. I've seen this piece of evidence, which is in the possession of zoologist Wolf-Henrich (Henner) Fahrenbach, Ph.D., and you can clearly see what appear to be compression marks or bruises (for lack of a better term) in the bark where large hands appear to have grabbed the sapling above and below the twisted section. On a positive note, Bindernagel did not address the issue of limb markers, teepees made from limbs or trees, etc.

Bindernagel acknowledges that a certain degree of resistance to new concepts is understandable and justifiable. His efforts are focused on arguing the theoretical reasonableness of what sightings and track evidence, in particular, suggest. That which can be tenably deduced regarding sasquatch biology, as summarized more thoroughly in Bindernagel's first book, supports the existence of a North American ape; there are no philosophical or scientific impediments sufficient to disqualify discussion and evaluation of the empirical evidence.

An interesting approach employed by the author for (hopefully) generating progress in scientific involvement is his contention that one can circumvent the reluctance of scientists to even discuss probative arguments, in the absence of or in advance of indisputable physical evidence, by considering that the sasquatch has already been discovered, this idea forming the basis for the title of the book. For starters, one could argue that the sasquatch has been repeatedly discovered,

based on eyewitness testimony and even claims that the creatures have been killed and examined (though not collected). The other aspect to this approach is that the sasquatch is representative of a previously documented animal, perhaps the giant Asian ape Gigantopithecus, illustrating a case of rediscovery. Bindernagel maintains that the "Great Ape Hypothesis" is testable and superior to alternative hypotheses put forth to explain the sasquatch phenomenon, and presents his case in the remaining chapters.

John Bindernagel's *The Discovery of the Sasquatch: Reconciling Culture, History, and Science in the Discovery Process* is a well-written book, copiously illustrated. It contains a few typographical errors, but so does every textbook I've seen in twenty-five years of teaching. I recommend it for the insight it provides into the world of science, where knowledge is tentative, but change is often slow and difficult. Some of the insights from the perspective of this scientist, who is supportive of the existence of a North American ape, regarding the activities of amateur self-styled investigators may not be pleasant for those individuals to read, but they are worth considering to help in understanding why mainstream scientists often appraise sasquatch-related "research" and related pursuits so unfavorably. As for the target audience, I hope *Discovery* (and future editions of it) is positively received. Only time will tell.

Finally, some thoughts regarding cost may be in order. I've seen and heard some disapproving and disparaging remarks about the $49 list price for *The Discovery of the Sasquatch*. It may be of interest to readers to know that the expense concerned the author as much, if not more, as anyone else, as can be seen when he wrote, "I apologize in advance for the high price." As stated earlier, this follow-up to his first book developed into an academic treatise, written for the purpose of "engaging philosophers, historians, psychologists, sociologists as well as other scientists in zoology, primatology, etc." As such, it is the product of extensive, thoroughly documented, research, seven years in the making. That is a long time, and it was an expensive process.

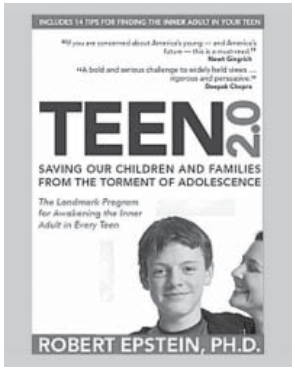
However, I realized as I initially flipped through the book, surveyed its contents, and began to study the arguments, that what I held represented much more than a seven-year investment of time and money; it was a lifetime of scholarship and experience. The value of a book is not a function of the cost or quality of paper any more than a painting is assessed in terms of the amount of paint it contains. Notwithstanding impertinent assessments of what *The Discovery of the Sasquatch* should or might be worth, it is not possible to compensate for the true "cost" involved with its creation, and it behooves us to simply be grateful that we can share in the life and consider the thoughts of such a man. I look forward to revisiting its pages again.

Alton Higgins
Mid-America Christian University , Oklahoma City, Oklahoma 73170

Teen 2.0: Saving our Children and Families from the Torment of Adolescence by Robert Epstein. Fresno, CA: Quill Driver Books, Linden Publishing, 2010. 500 pp. $18.95. ISBN 9781884995590.

Robert Epstein's argument can be stated simply: American teens have high rates of depression, suicide, crime, substance abuse, pregnancy, and other serious problems. The cause of this has little or nothing to do with something called "adolescence"; it is because teens are not allowed to progress to adulthood—they are infantilized. Adults assume that teens lack the capability to make sensible decisions. In fact, argues Epstein in a succession of chapters, they "are capable thinkers," they "can love,"" they "are tough," they "are creative," and they "can handle responsibility." There should be tests of competencies for adulthood; once passed, however young you are, you should be able to proceed to full adulthood, with its rights, but also its responsibilities. All this is argued in clear, jargon-free prose, addressed more to the anxious parent than to the academic community, though always backed up by reference to academic research and sometimes taking issue with some of that research, for example on teen brains.

Historically, Epstein traces the present crisis back to the time, starting roughly in the mid-nineteenth century, when often well-intentioned people such as Jane Addams started campaigns to protect children from aspects of the adult world where they seemed to be exploited and where it was hard to have anything like a "childhood." Children were, slowly, removed from the labor market; if they were in trouble with the police they began to be taken to special children's courts. Coinciding with this was the enormous impact of G. Stanley Hall's work on adolescence, presenting it as a time of storm and stress. Before this, Epstein argues, for centuries children had progressed easily and naturally into the adult world, working alongside adults according to their growing capabilities, and learning from them. Historians might well counter that Epstein has failed to take account of much evidence that youths in earlier centuries often formed age-related groups to distinguish themselves from both children and adults, and were often thought to be at the root of much social disorder, but his general point of a change in the experience of young people in the late nineteenth and early twentieth centuries stands. Fundamentally, it was down to the successive raising of the school-leaving age and the much later entry into the labour force. It was accompanied by two other trends. First, there was a reversal in the flow of cash between generations. Roughly until the mid-twentieth century, the majority of young people, when they started work, handed over their wages to their mothers—they were working primarily for their families, not for themselves. Then, in a process we don't fully understand, they began to keep their earnings to spend on themselves, and looked to their parents to supplement those earnings. Second, legal restrictions on what young



people could do escalated, especially from the 1970s. The outcome was a situation where teens had more access to cash than in the past but were restricted by law from spending it in ways they might want to. That, of course, did not stop the development of a massive market aimed at teenage expenditure.

There are three reasons why readers might pause before embracing in its entirety Epstein's analysis and argument. First, in making his case that teens are in trouble in the United States he seizes unerringly on the most negative data. True, he has uplifting stories of teen achievements, but the book would have no point if he couldn't depict a crisis of the teen years. Take, for example, one of many statistics, that in 2007 38.9 per cent of teens received treatment for a major depressive episode. We might immediately begin to ask who has defined what constitutes "a major depressive episode," or indeed "treatment." Does the raw statistic, repeated by Epstein several times, for it is on the face of it shocking, tell us quite what it seems to? More important, is it even accurate? I was unable to access the source Epstein quoted, but the same database (*National Survey on Drug Use and Health: Major Depressive Episode among Youths Age 12 to 17 in the United States: 2004 to 2006*, http://www.oas.samhsa.gov/) states clearly that for 2004–2006 only 8.5 per cent of youth 12–17 reported experiencing a major depressive episode in any one year. 38.9 per cent or 8.5 per cent? It's quite a difference. I found myself wondering as I read the book what a teen would make of it. In the United Kingdom, one of the things teens complain of is the constantly negative depiction of themselves—they don't recognize themselves in the chorus of complaints from adults. The same, I suspect, would be true of the United States.

Second, if Epstein is keen to do away with "adolescence," he seems content to keep unexamined two equally slippery terms, "childhood" and "adulthood." Childhood for Epstein is pre-puberty, and he doesn't have much to say about it. And yet it is the background from which the troubled teens emerge. Many scholars distinguish between an Anglo-Saxon and a Scandinavian approach to childrearing, the first based on the assumption of the child's incompetence, the second on its competence. If Scandinavian teens are less troubled than American ones, it may be in part because they have been encouraged almost from birth to become competent. Epstein seems to want to leave the goal of competence to the teen years—it may by then be too late. As for adulthood, Epstein is fully aware that adults often fail to behave as adults should, but that may be because we have a totally unrealistic set of assumptions about adulthood, equating it

often with the goal of "maturity" set before us by psychologists. If we're going to do away with adolescence, why not also do away with other age indicators, and just treat all people as "persons"?

Third, if the teenage years present more problems in the United States than elsewhere, it may be that Epstein has missed a crucial reason for that. In the 2007 UNICEF survey of children's well-being in 21 industrialized countries, the bottom two countries, and by quite a margin, were the United States (20th) and the United Kingdom (21st). The survey in fact focused primarily, not on pre-puberty children, but on teenagers. What characterizes and distinguishes these two countries is the extent of inequality in them. There is mounting and compelling evidence that on a wide range of indices, inequality is associated with negative outcomes and social problems—see, e.g., Richard Wilkinson and Kate Pickett, *The Spirit Level: Why More Equal Societies Almost Always Do Better* (London: Allen Lane, 2009). By and large Epstein treats the teens of the USA as if they were all the same, making some distinctions by gender, but few by ethnicity or social class. Inequality is bad for everyone, wherever they are on the social scale, but it is worst for those on the bottom. It is undeniable that Epstein has pointed valuably to ways forward in attitudes to and policies toward teenagers in the United States, but he may have ducked the root problem, inequality.

Hugh Cunningham
University of Kent

Science as a Spiritual Practice by Imants Barušs. Imprint Academic, 2007. 155 pp. $29.90. ISBN 9781845400743.

Imants Barušs' book has a promising title, *Science as a Spiritual Practice*. From the onset he suggests that because we are so steeped in materialism, spirituality for the orthodox scientist is "forbidden research." Barušs then presents two sets of arguments as to why this form of materialism is dead and proposes that we can open ourselves to new forms of knowing

The first argument comes from quantum theory where he gives the examples of non-locality, as demonstrated by such experimental physicists as Alain Aspect, and the double slit experiment (where a single electron appears to travel through both slits in a screen and then interferes with itself). Of course such arguments are already well-accepted by even the most hardnosed scientists. But while this indicates that materialism in the strict Newtonian sense is limited, it would not necessarily persuade such scientists that there is something other to the world than matter itself. It would still allow them to argue, for example, that consciousness is not some radically new realm but no more than an epi-

phenomenon of matter, i.e. something secreted by the physical brain, just as bile is secreted by the liver, but not necessarily acting back on that physical brain to affect our actions.

And so we come to Barušs' second set of arguments against reductionist materialism. Here he explores such areas as the paranormal, near-death experiences, hypnosis with regression to past lives, and the changes in our comprehension of the world brought about through psychedelic drugs. He also refers to dream incubation where it is possible to give a person a question that will be solved during the dream. He places particular emphasis on Random Event Generators and indeed begins his first chapter with an account of an incident in which a group of his colleagues watched a sunset over Lake Huron. During this moving experience the Random Event Generator showed significant deviations from pure randomness. Barušs' conclusions were that "there was synchrony that was not mediated by any known physical mechanisms between the entranced activity of the group of people watching the sunset and a random functioning mechanical device."

The problem with such arguments is that they will simply not convince the army of "hardnosed scientists" that we should open our minds to new ways of experiencing the world. Witness the considerable controversy during 2010 when it was suggested that certain physicists, who also had an interest in the paranormal, should not be invited to participate in a scientific conference concerning the foundations of quantum theory.

But leaving aside attempts to convince the reader, what does Barušs propose? That the normal physical world is a mirror reflection of the unmanifest and that we have the ability to constantly flicker between the two realms. Here he suggests that an electron can manifest itself in New York, unmanifest, and then manifest in Toronto, and he relates this to teleportation. But if this is the case then why are we not more aware of our connection to the unmanifest? Barušs suggests that we are held in our normal waking state by a type of hyperactivity that is related to the fear of death, and that this acts to shut down our connection to the transcendental.

Finally the author introduces the work of Franklin Wolff who proposed what he termed "mathematical yoga" as a spiritual practice for reaching transcendental states of consciousness. As a metaphor, the series 1 + 1/2 + 1/4 + 1/8 + would correspond to the operation of formal consciousness, whereas its sum "2" can only be reached by the transcendental. According to Wolff, "mathematical yoga" could be a powerful approach for people of the West.

After all, he suggests, mathematics itself is something that has descended from the transcendental domain and can therefore lift the mind closer to the divine. Mathematics itself approaches transcendental knowledge when it becomes so abstract that nothing is left for the senses to grasp. But does this mean that this is the exclusive path for mathematicians alone? Barušs suggests it can be used more generally for those who have "a scientific perspective."

I must confess that on completing the book I was not at all clear how mathematical yoga was supposed to work, nor was I convinced by Barušs' various arguments as to why ordinary working scientists would feel compelled to reject their present metaphysics. Likewise that the physics community as a whole can be characterized as clinging to the sort of naïve materialism he describes. The spectrum of opinions and belief systems within physics seems to me much more wide and varied.

As to materialism, Isaac Newton, for example, wrote more on the hermeneutics of the *Bible* than he did on physics. In addition, it was his intention that his alchemical work toward discovering the "one catholick matter" should be included in his *Principia Mathematica* in order to provide a more complete picture of the physical world. Likewise Faraday's conviction that God's laws are reflected in the unity of the physical universe caused him to seek to unify the phenomena of electricity and magnetism. Pasteur, for his part, was looking through a microscope when he was asked if he ever prayed. "I'm praying now," was his reply.

Wolfgang Pauli argued that while the spirit in matter had been denied with Descartes, the time had now arrived for "the resurrection of the spirit in matter." He also sought a dimension of Soul in the modern scientific conception of the world.

And as to Einstein:

> To know what is impenetrable to us really exists, manifesting itself to us as the highest wisdom and the most radiant beauty, which our dull faculties can comprehend only in their most primitive forms—this knowledge, this feeling, is at the center of all true religiousness. In this sense, and in this sense only, I belong to the ranks of devoutly religious men. (Einstein, 1990)

For the giants at least, science has always been a spiritual practice.

And of the rest, thanks to Templeton Foundation funding, the Metanexus Institute promoted a series of "local society initiatives" whereby scientists at different universities and centers could come together to discuss the links between science and religion. Even a meeting of atheists and agnostics at King's College, London, in 2001, agreed that, while rejecting religion, for each of them there was something that could be said to be sacred in the world.

So there is certainly a long history of connection between science and religion, or the sacred. On the other hand there is also the issue of what proper

place each should occupy in this debate. Georges Lemaître, for example, discovered that Einstein's field equations could point to the universe having an origin in time (later nicknamed by Fred Hoyle as the "Big Bang"). For this, the Belgian priest was praised by Pope John XXIII as endorsing the *Genesis* story. But this phrase was not well-received by Lemaître who felt science and religion had no business supporting each other's domains, an argument that has been repeated by the former Papal Astronomer George Coyne, SJ, when he refers to science and religion as "the two Sacred Cows." Thus while there is evidence to suggest that science can, for some, indeed be a spiritual practice, it is an area that should be entered with great delicacy and intelligence.

F. David Peat
Pari Center for New Learning, Italy

Reference

Einstein, A. (1990). Strange is our situation here on Earth. In J. Pelikan (Ed.), *Modern Religious Thought,* Boston: Little, Brown, & Co.

The Ego Tunnel: The Science of the Mind and the Myth of the Self by Thomas Metzinger. Basic Books, 2010. 288 pp. $16.95 (paperback). ISBN 978-0465020690.

In *The Ego Tunnel*, Thomas Metzinger does a lively, readable, and competent job of dismantling an important bit of philosophical confusion. Unfortunately, he seems to do so only to replace it with a similar confusion.

Metzinger's goal in the book is to respond to a venerable philosophical position called realism. The idea, roughly, is that the world has in it existing objects and that these objects stand in various objective relationships to each other. These arrangements of objects are facts, and it is these facts that make our beliefs about objects either true or false. If a sentence asserts a relationship holding between objects, and if it is a fact that these objects do indeed exist and have that relationship, then the sentence is true. The sentence otherwise is false. Realism thus splits the world neatly between observers and things observed.

This view is such transparent common sense that it is difficult to phrase it in any interesting way. It also is confused.

To see why, ask how it is that we, in our minds, come to know about the world. The obvious answer would be that our senses serve as some sort of intermediary, importing structure from the world and recreating it within our thoughts about the world. That is, our senses have the job of shaping our thoughts about the world into something structurally like the world itself, into a picture that looks like the world. But if our thoughts are some sort of picture,

then it seems that we must think of ourselves as some sort of inner being looking at that picture. The problem then has to do with the nature of that inner being. Are its thoughts about our thoughts further pictures of our pictures? Who is looking at those pictures? Are we to believe that there are voyeuristic turtles all the way down?

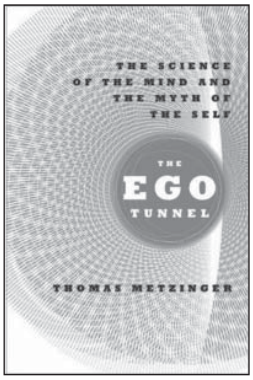
Metzinger is not the first to present this line against realism; still, he presents it crisply and engagingly. In doing so, he also highlights a far more novel problem with traditional, naïve realism. To say that our senses are the medium through which our thoughts become shaped like the world privileges the human sensorium in a highly implausible way. As it happens, we are built to exploit some of the world's information. Certain wavelengths of light will register on our optic nerves; our eardrums will register certain variations in air pressure, etc. But the world is *bursting* with information, and only a very, very narrow range of it is present to human senses. This is the tunnel part of the book's central metaphor: A tunnel is a narrow access route carved through a vaster landscape. In just that way, our senses recover a narrow band of information extracted through a vaster array of causal interactions.

Still, though, we might ask about what lies on either end of this tunnel. The risk is that the tunnel metaphor invites us to recreate just the dualistic scheme it was meant to correct. What Metzinger clearly does not want to say is that our senses tunnel through myriad channels of information available, and so create a route from the world to a mind. That just would be another realism: less naïve than traditional, perhaps, but no less problematic logically. He avoids this by dispensing one endpoint. Minds are not things at one end of the tunnel; they are a feature of the tunnel itself.

It works this way: Fundamentally, our minds have the job of representing the world. There are many things abroad in the world. Some of them are represented to us, while most are not. One of the things we each do need to represent, though, is our own body. There is obvious and ongoing need to think about the things of the world not just in the abstract but also in their particular relationship to ourselves.

This, then, is the self: a representation (one among many) of a thing in the world (a person's body). Consciousness, then, is nothing more than the *content* of that representation. To be conscious is to represent your self. That is the other half of the book's central metaphor. An ego tunnel is not a tunnel running from the world to an ego; it is a tunnel that has an ego as one element of its own construction. In this way, Metzinger neatly avoids the problem of the inner audience.

That solution comes at a cost, though. The notion of representation he employs is as troublesome as the notion of the internal audience it is introduced to eliminate. The problem is that whether a signal is a representation—let alone a particular one—seems to be a matter of interpretation, and this would imme-



diately reintroduce just the sort of inner interpreter Metzinger dismissed earlier.

Metzinger, for example, takes the somewhat heroic stance that computer learning is not only a principled possibility but a current reality. His example involves starfish-shaped robots that model their own bodies. When the body is altered, the internal model changes, rewriting the previous description with a current one.

Is this truly learning? A block of wood being whittled into the shape of a horse also undergoes a change of state. Surely we don't want to say that it is learning to be more horselike. So it seems that some images undergoing changes of state are representations, while others are not. Which are which?

An old answer, with a vast literature, is that images count as representations in light of their history, their previous associations. (A dollar bill is currency, whereas an atom-for-atom duplicate is a forgery, in light of the *historical* fact that the legitimate bill was authorized in the right way.) This view would be a disaster for Metzinger, though. Since he is defining the self as a representation, he cannot define representations in terms of relations to the self on pain of circularity. Nor does he do so, dismissing instead the entire tradition in an airy page.

Instead, he has it that representation is some sort of *intrinsic* property. (He does not use the word intrinsic, but he does assert that any claims that origins are relevant to meaning are instances of the genetic fallacy.) But this intrinsic representation is no less odd, metaphysically, than the self it replaces. Suppose, for instance, that I wanted to describe to you a baseball play I saw. Lacking adequate vocabulary, I take up a few bits and pieces from the table in front of us. ("Okay, so the salt shaker is the shortstop, and this fork is the second baseman . . . "). If I did not *assign* a representational role to the salt shaker, then it must have had it all along. When, and in virtue of what, did this become a shortstop-indicating saltshaker? With what powers of foresight did the manufacturers make it so?

Possibly Metzinger has answers to questions of this sort. The book is not a technical one, and Metzinger systematically refuses to engage the material at that level of detail. While this can make reading *The Ego Tunnel* frustrating, it also keeps the text energetic and clear. This stylistic choice is appropriate for a book whose audience is interested generalists rather than academic philosophers. It may be fitting for a book on metaphysics that its most serious shortcoming lies in what is not in it rather than in what is.

Greg Ealick
ealick@umbc.edu

Experimental Investigation of the Spirit Manifestations: Demonstrating the Existence of Spirits and Their Communion with Mortals by Robert Hare. New York: Partridge & Brittan, 1855. 460 pp. 1963 reproduction from The Sycamore Press, Elm Grove, Wisconsin. $20 (hardcover). Free PDF of original 1855 version at http://www.archive.org/details/experimentalinv00hare

Author Robert Hare (1785–1858) was a renowned inventor and an esteemed professor of chemistry at the University of Pennsylvania before becoming one of the first psychical researchers. Only John W. Edmonds, a New York Supreme Court judge, seems to have preceded Hare as a serious and dedicated psychical researcher following the mediumship outbreak in 1848 in the U.S.

Hare was called to the chair of chemistry and natural philosophy at William and Mary in 1818 and that same year was appointed as professor of chemistry in the department of medicine at the University of Pennsylvania, where he would remain until his retirement in 1847. He was awarded honorary M.D. degrees from Yale in 1806 and Harvard in 1816. In 1839, he was the first recipient of the Rumford Award for his invention of the oxy-hydrogen blow-pipe, a forerunner of the acetylene torch, and for his improvements in galvanic methods. He was a member of the American Academy of Arts and Sciences, the American Philosophical Society, and an honorary life member of the Smithsonian Institute. In addition to frequently writing on scientific subjects, Hare also wrote, using the pen name Eldred Grayson, articles on political, economic, and philosophical issues. In an 1810 article, "Brief View of the Policy and Resources of the United States," Hare advanced the idea that credit is money. He also wrote frequently in opposition to slavery.

This book details Hare's introduction to mediumship in 1853 and his 14 months of investigation of various mediums, leading to his conversion to Spiritualism and the development of his own ability as a medium. While the book leaves much to be desired in organization and flow, it more than makes up for it in mind-boggling content. It no doubt exceeded the boggle threshold of most readers in Hare's day, and, considering that not much progress has been made in understanding and accepting such phenomena, it will undoubtedly exceed the boggle threshold of most of today's readers.

"It is a well-known saying that there is 'but one step between the sublime and the ridiculous,'" Hare states in the Preface. "This idea was never verified more fully than in the position I find myself" (p. 14). He goes on say that most readers will have a difficult time accepting his report, but that there was a "method to his madness" and that "if I am a victim to an intellectual epidemic, my mental constitution did not yield at once to the miasma" (p. 15).

Hare explains that he began investigating mediums in 1853 after writing

a letter to the *Philadelphia Inquirer* denouncing the "popular madness" being called Spiritualism by the American press. When one of the readers wrote a letter to Hare and suggested he investigate before jumping to conclusions, Hare agreed that it was the proper thing to do.

After his first few sittings with mediums, in which the communication came primarily by table tilting or raps, Hare, inventor that he was, immediately went to work contriving an apparatus which would facilitate and expedite communication, as the process he had observed was very slow. He devised a machine, called a spiritoscope, with a circular disc, the letters of the alphabet around the circumference of the disc, and with weights, pulleys, and cords attaching it to the tilting table. (Drawings of several versions of the apparatus are presented in the book.) The medium would sit behind the table in order to supply the "psychic force" through which the spirits caused the table to tilt, but the medium could not see the wheel and had no idea what was being spelled out.

Put to the test, the contraption worked, and the first spirit to communicate was Hare's deceased father, Robert Sr., a prosperous Philadelphia brewery owner when incarnate. A number of evidential messages were given, but Hare remained skeptical. "Oh, my son, listen to reason!" the senior Hare finally admonished his son (p. 41). At a second sitting, the father again communicated, saying that his mother and sister were also there but not his brother. Personal information was given to Hare, information which Hare was certain the medium could not have researched.

In his third sitting, when the message was spelled out that his sister was there, Hare asked her for the name of their father's early business partner and for the name of their English grandfather's partner who had died in London more than 70 years earlier. Both names were correctly given. "The medium and all present were strangers to my family, and I had never heard either name mentioned, except by my father," Hare recorded. "Even my younger brother did not remember that of my father's partner" (p. 45).

With another medium, Hare asked his father for the name of an English cousin who had married an admiral. The father spelled out the name. Hare also asked his father for the maiden name of an English brother's wife. The spiritoscope spelled out "Clargess," which was correct. A number of other interesting bits of evidential information were provided. In one reading, Hare heard from the son of a cousin who lived in Canada. The young man told of his recent death, a fact which Hare was unaware of until then but was confirmed when he contacted the cousin. Although not yet called "telepathy," Hare was aware of the possibility of "mind reading," and this communication was clearly outside the scope of normal telepathy. The young man also answered questions about family matters, which Hare judged correct.

Hare reported that he witnessed tables being levitated by spirits. In some

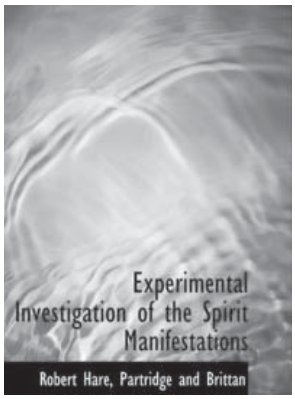
cases, no human was in contact with the table, but in others the hands of the medium were placed gently on the table. "On one occasion I saw a large circular table, supported by three massive claws on castors, overset several times by the influence of three ladies, who were media," he wrote, adding that he positioned himself in such a way that he could see everything and was certain there was no trickery (p. 46). He asked his deceased sister the purpose of putting the medium's hands on the table and was told that the presence of hands enabled the spirit to act in opposition to them. Hare recorded:

> Within the last fourteen months I have seen twenty-two or three different mediums—all but four of them private ones—taking no pecuniary compensation; and more than half of them are our own citizens, several of them who are now present in this assembly. I have spent many hours in their presence. Have seen them at their homes—at my own home—and in the parlours of neighbors and friends. I have met and watched them in the broadest sunlight and at evening. Every desirable opportunity has been furnished me for detecting machinery, jugglery, or imposture, and I have faithfully, but in vain, strove to find something mundane, a sufficient cause for all these wonders. That trick or humbug is sometimes attempted by pretenders to uncommon susceptibilities; no one will have a wish to deny. But very many of the mediums, private ones, are as much above these things as are the very best persons among the witnesses. (p. 59)

Hare put many questions to the communicating spirits. He asked them what the various mediumship phenomena were all about and was told that they were "a deliberate effort, on the part of the inhabitants of the higher spheres, to break through the partition which has interfered with the attainment, by mortals, of a correct idea of their destiny after death" (p. 85). To carry out this intention, he was told, a delegation of advanced spirits had been appointed. "Referring to this statement, I inquired how it happened that low spirits were allowed to interfere in the undertaking," Hare penned. "The answer was that the spirits of the lower spheres being more competent to make mechanical movements and loud rappings, their assistance was requisite" (p. 85).

It was explained to Hare by his father that the spirits direct currents of vitalized electricity on the particular muscles of the medium which they desire to control. Moreover, the father said that it is not necessary that the medium be a person of good moral character or have a balanced mind, but an advanced spirit would not be able to control the organs or mind of a medium unless in affinity with the medium. When spirits wish to impress the mind, the spirits can dispose and arrange the magnetic currents of the brain so as to form or fashion them into ideas of their own. "We can instantly determine the sphere of a spirit, in or out of the body, by the particular brilliancy and character of the light in which he is enveloped, as well as by the peculiar sensation which his presence creates" (p. 94).

Hare asked why it all started at the home of the Fox family in Hydesville, New York. The response was that the delegation felt that the spirit of a mur-



dered man would excite more interest, "and that a neighborhood was chosen where spiritual agency would be more readily credited than in more learned or fashionable and conspicuous circles, where the prejudice against supernatural agencies is extremely strong" (p. 85). It was further communicated that the results fell far short of the expectations, and although Hare does not clearly state it, one might infer from his comments that physical phenomena came about because the delegation concluded that simple communication was not having the desired effect in convincing humans of the existence of a spirit world.

Hare corresponded with a number of people concerning the phenomena and offers some of the more interesting letters in the book, two of them involving the famous D. D. Home, referred to by Hare as "Mr. Hume." One Rufus Elmer, Esq., of Springfield told of witnessing amazing physical phenomena, including levitations and floating objects, when Home spent two days with him.

After satisfying himself of the reality of the spirit world Hare began asking more questions about the nature of that world. The spirits explained to Hare that there are degrees of gradation between the lowest degrees of vice, ignorance, and folly and those of virtue, learning, and wisdom. One's initial place in the afterlife environment, he was told, was based on a sort of "moral specific gravity." He was further told that the spirit world is divided into seven concentric regions called spheres, the first one called the rudimental sphere and the remaining six spiritual spheres. "The first sphere is the abode of all the most degraded spirits, and that their advancement, however, slow it may be, is nevertheless sure, since 'onward and upward' is the motto emblazoned on the spiritual banner" (p. 96).

The seventh sphere, he was informed, is the entrance into the supernal heaven. "With regard to the social constitution of the 'spheres,' each is divided into six circles, or societies, in which kindred and congenial spirits are united and subsist together, agreeably with the law of affinity" (p. 89).

Communicating through the mediumship of Mrs. M. B. Gourlay, a spirit named Maria communicated with her father, a friend of Hare's, and gave a detailed account of her entrance into the spirit life. She told of being given a guided tour of the first and second spheres. "All are seeking to minister to their perverted tastes," she observed of these lower realms.

> Some are holding forth in loud tones, and painting in false and gaudy colours the joy of their home; others, who occupied high stations on earth, hang their heads in confusion, and would fain hide themselves from view; but

> they are taunted with rude jests, and told that their 'pride of position will avail them nothing here.' One heart-sickening feature of this place is the absence of children. . . . (p. 105)

On the third sphere, Maria communicated, comparative order reigns and the beauty of it transcends that of earth. "The inhabitants of this sphere are anxious for instruction. The teachers from the higher degrees are listened to with profound respect and attention" (p. 105).

Maria found her home on the fourth sphere, where, she said, the beauty far exceeds any scene on earth. The boundaries between spheres, she further explained, are not marked by any visible partition. Rather, the spirits have a "peculiar sense" which allows them to feel when they are passing from one sphere to another.

Although he mentions that he acquired mediumistic ability, Hare does not go into detail about it. "But having latterly acquired the powers of a medium in a sufficient degree to interchange ideas with my spirit friends, I am no longer under the necessity of defending media from the charge of falsehood and deception," he wrote. "It is now my own character only that can be in question" (p. 54).

On July 3, 1855, Hare was staying at the Atlantic Hotel on Cape May Island, and at 1 a.m., when he knew that his friend Mrs. Gourlay was conducting a séance in Philadelphia, he asked his deceased sister to go to Mrs. Gourlay and request her to induce Dr. Gourlay, her husband, to go to the Philadelphia Bank to ascertain at what time a note would be due and that he would sit at his instrument at 3:30 that day to receive the answer.

> Accordingly, at that time, my [sister] manifested herself and gave me the result of the inquiry. On my return to the city, I learned from Mrs. Gourlay that my angelic messenger had interrupted a communication, which was taking place through the spiritoscope, in order to communicate my message, and, in consequence, her husband and brother went to the bank, and made the inquiry, of which the result was that communicated to me at half-past three o'clock by my spirit friend. (p. 33)

As the time given him by Dr. Gourlay was not what he had remembered, Hare concluded that mind reading was not a factor in this experiment.

Hare seems to have discussed every possible subject with the communicating spirits, including God, Christ, the nature of time, the nature of matter, gravitation, the soul, celestial marriage, the fate of infants who die at birth, auras, the teachings of organized religion, deathbed visions, odic force, etc., etc. As indicated earlier, however, the book is not well-organized. Hare will discuss a particular subject early in the book, return to it in the middle of the book, and again in the end without making mention of the earlier references. Moreover, the book has no index. There are 2,070 numbered paragraphs, not including a fairly long Appendix. It is sometimes difficult to tell whether a spirit

is being quoted or Hare is stating a fact he has learned from spirit. It is, nevertheless, a very intriguing read and offers much food for thought. Considering the wealth of information set forth in this book and the earlier 1853 book titled *Spiritualism* by Judge Edmonds and Dr. George T. Dexter, one might surmise that the advanced delegation of spirits referred to by Hare simply threw up their arms in frustration and went away, leaving the work to less-advanced spirits.

After Hare gave a talk to the American Association for the Advancement of Science in which he spoke of his interest in spirit communication, some members called for his expulsion from the organization. However, this apparently resulted in Hare becoming even more entrenched in his belief and he went to his grave certain that there was something beyond death.

> No evidence of any important truth in science can be shown to be more unexceptionable than that which I have received of this glorious fact that heaven is really "at hand," and that our relatives, friends, and acquaintances who are worthy of happiness while describing themselves as ineffably happy, are still progressing to higher felicity; and while hovering aloft in our midst, are taking interest in our welfare with an augmented zeal or affection, so that, by these means, they may be a solace to us, in despite of death. (p. 428)

Michael E. Tymn
Academy of Spirituality and Paranormal Studies, Kailua, Hawai
METGAT@aol.com

The Night-Side of Nature. Or, Ghosts and Ghost-Seers by Catherine Crowe. London: T. C. Newby, 1848, 2 vols. Free at http://www.archive.org/details/nightsideofnatur01crowiala (vol. 1) and http://www.archive.org/details/nightsideofnatur02crowiala (vol. 2).

Catherine Crowe (née Stevens) was born in Borough Green, Kent, in 1790 (or 1795 according to some sources) and educated privately. Nothing is known of her parents, yet we can assume that they were either well-educated or merely determined that their only known child should be, as she certainly was, for Catherine acquired a wide knowledge of French and especially German literature in addition to the classics and history of science. She married Major John Crowe and had a son in 1823, of whom we also know nothing, but seems to have abandoned her husband in 1838 and moved to Edinburgh where, unusually for women of the time, she set up house on her own and embarked on her career as a novelist.

Her first novel, *The Adventures of Susan Hopley*, was published anonymously in 1841 and was an immediate success, being followed two years later by *Men and Women*, or *Manorial Rights*. Then came a change of direc-

tion with her translation (1845) of Justinus Kerner's *Die Seherin von Prevorst* (The Seeress of Prevorst) (1829), which is still in print today and apparently remains the only English translation of this classic study of the mediumship of Friederike Hauffe.

It was evidently this book, and others by such prominent German explorers of the psychic field as Joseph Ennemoser, J. H. Jung-Stilling, and J. C. Passavant, then virtually unknown to the general reading public in England, that prompted Crowe to embark on the work for which she is best known and which is the subject of this review. Once again, she had a massive best-seller to her credit, the book going through no less than sixteen editions in six years and several subsequent ones. It is also still in print in a number of editions.

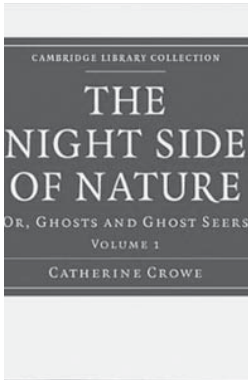
Crowe's admiration for the German authors mentioned above is matched by her contempt for such British skeptics of her day as John Ferriar (*An Essay Toward a Theory of Apparitions*, 1813) and Samuel Hibbert-Ware (*Sketches of the Philosophy of Apparitions*, 1825). The first chapter of *The Night-Side of Nature* is a vigorous counterblast against "The pharisaical scepticism which denies without investigation" and which ". . . is quite as perilous, and much more contemptible, than the blind credulity which accepts all that it is taught without inquiry; it is, indeed, but another form of ignorance assuming to be knowledge" (p. 9).[1] By investigation, she added:

> I do not mean the hasty, captious, angry notice of an unwelcome fact, that too frequently claims the right of pronouncing on a question; but the slow, modest, pains-taking [sic] examination, that is content to wait upon Nature, and humbly follow out her disclosures, however opposed to preconceived theories or mortifying to human pride. . . . If scientific men could but comprehend how they discredit the science they really profess, by their despotic arrogance and exclusive scepticism, they would surely, for the sake of that very science they love, affect more liberality and candor.

Then as now! The above extracts give some idea of the author's lively polemic style, and one is tempted to quote from almost every page of this exhilarating book, which is as compulsive a page-turner as any popular Victorian novel. Crowe makes her intentions clear in her Preface (p. 4):

> My object is to suggest inquiry and stimulate observation, in order that we may endeavor, if possible, to discover something regarding our psychical nature, as it exists here in the flesh; and as it is to exist hereafter, out of it.

She particularly laments the fact that "any discovery [such as mesmerism] tending to throw light on *what most deeply concerns us*, namely, our own being, must be prepared to encounter a storm of angry persecution" (p. 12). Her words make an interesting comparison to those of Myers (1903, vol. ii:1) when he laments the fact that "man has never yet applied to the problems *which most*



profoundly concern him those methods of inquiry which in attacking all other problems he has found the most efficacious," the outstanding question being "whether or no his personality involves any element which can survive bodily death" (emphasis added).

The name of Crowe does not appear in the index to Myers' *Human Personality*, and she is dismissed in a somewhat patronizing footnote (vol. ii:570) where Myers mentions in passing "an English translation [of Kerner's book], greatly abridged, by Mrs. Crowe." He makes no mention of the fact that more than fifty years previously she had been embarking on a mission very similar to his, amassing a huge amount of evidence, much of it obtained at first hand from her own friends and acquaintances, for many of the areas he and his colleagues are often credited as the first to explore.

Near-death and out-of-body experiences, phantasms of both living and dead, doppelgängers, wraiths, ghosts, poltergeists, precognitive and shared dreams, stigmata, dowsers, twin telepathy—they are all here, often described in considerable detail, some such as poltergeists for the first time in English. (She is generally credited as the first British author to refer to "the Poltergeist of the Germans," as her Chapter 16 is entitled). As Colin Wilson (1986:xii) points out, "the Society for Psychical Research paid a kind of posthumous tribute to Mrs Crowe by tacitly adopting her aims and methods; but they took care not to mention her name."

True, she can be faulted for being somewhat imprecise as to her sources, naming them, for example, as "Miss D— of G—" or "Captain S—" and referring to a case "the authenticity of which I can vouch for," and although she frequently cites Ennemoser, Jung-Stilling, and other German writers as sources, she does not name specific works such as the former's *Der Magnetismus im Verhältnisse zur Natur und Religion* (1842), the latter's *Theorie der Geisterkunde* (1808), and Johann Passavant's *Untersuchung über den Lebensmagnetismus und das Hellsehen* (1837), which would seem to have been some of her most likely primary sources.

The editor of a collection of "Half-Forgotten Books," Ernest A. Baker, describes her somewhat sniffily as "a rather miscellaneous writer" who "took herself rather seriously as a thinker." Yet he does give her credit for "an enthralling book for those who revel in the mysterious and the terrible," and also makes the pertinent point that her book is "no less elevated and serious than that of the late F. W. H. Myers," though he does castigate her for her inadequate sourcing compared to Myers (Baker, 1904).

However, in a more recent reissue, the Editor of the journal *Folklore*,

Gillian Bennett, springs to her defense (Bennett, 2000):

> For folklorists and cultural historians, Mrs. Crowe's lack of system is actually a bonus. Because everything is jumbled up together—legends, personal experience, dîtes, and rumours—each validates the other to present a picture of the sorts of things that were reported, transmitted and thought believable at one particular point in time.

Sadly, Mrs. Crowe's private life also appeared somewhat lacking in system by 1854, when a bizarre incident was widely reported that suggested that she was having mental health problems. According to no less an authority than Charles Dickens (1854), in a letter to a friend:

> Mrs Crowe has gone stark mad—and stark naked. She was found t'other day in the street, clothed only in her chastity, a pocket-handkerchief and a visiting card. . . . She is now in a mad-house, and I fear, hopelessly insane.

Although there is evidence from her Edinburgh neighbour Robert Chambers (1854) that there was some truth in reports of this incident, Dickens seems to have been mistaken with regard to her mental state, for a few weeks later Crowe (1854) wrote a wholly lucid letter to a newspaper explaining that she had merely suffered a severe attack of "chronic gastric inflammation" (perhaps an ulcer?), was now convalescing, and was certainly not in a mad-house. She cannot have gone completely off her head since she published a further four books between 1854 and 1862, though she remained silent from then until her death in 1875, and her later years, like so many of her earlier ones, remain undocumented. There are even disagreements as to the date of her death as well as birth, some sources giving 1872. Indeed, little of her private life seems to be known for certain.

Although her reputation as a novelist has faded, unlike those of her near-contemporaries Jane Austen and the Brontë sisters, Catherine Crowe's place in the history of psychical research looks set to endure, as the lasting popularity of *The Night-Side of Nature* indicates. Books do not remain in print for more than 160 years without good reason, and it is clear why this one has. It is written by a skilled author who knows how to grab the attention of her readers and hold it, and who has something she considers important to say, which is that large areas of human experience are being ignored, "either denied as ridiculous or impossible, or received as evidences of supernatural interference" (p. 4). She was a pioneer explorer of those areas, a diligent field researcher, and an avid collector of reports of anomalous and inexplicable events. She was also one of the first, and still one of the best, at giving skeptics a good hammering.

The modern reader will rightly regret the absence of an index or list of references, and the author's somewhat casual attitude to her sources. Yet these shortcomings are more than compensated for by the mass of case-history mate-

rial, much of it obtained from the original source, that she was able to present in a compellingly readable form. For all its shortcomings, *The Night-Side of Nature* should be "half-forgotten" no longer, but remembered as the book that broke the ground so expertly cultivated several decades later, without acknowledgment to the ground-breaker, by the founders of the Society for Psychical Research.

Note

[1] All page numbers of quoted material from *The Night-Side of Nature* are from the 1986 edition.

Guy Lyon Playfair
7 Earls Court Square, London SW5 9BY
guylyonplayfair@o2.co.uk

References

Baker, E. A. (1904). Editor's Introduction. In C. Crowe, *The Night Side [sic] of Nature.* London: George Routledge & Sons.

Bennett, G. (2000). Introduction. In C. Crowe, *The Night-Side of Nature.* London/Ware: Wordsworth Editions/The Folklore Society.

Chambers, R. (1854). Letter to Alexander Ireland, March 4. Department of Manuscripts, National Library of Scotland.

Crowe, C. (1854). Letter. *Daily News*, April 29.

Dickens, C. (1854). Letter to Rev. James White, March 7.

Myers, F. W. H. (1903). *Human Personality and Its Survival of Bodily Death*. 2 vols. London: Longmans, Green, and Co.

Wilson, C. (1986). Introduction. In C. Crowe, *The Night-Side of Nature*. Wellingborough: The Aquarian Press. [facsimile of unspecified, single-volume, early edition]

Supernatural Hawaii by Judi Thompson. Schiffer Publishing, 2009. 224 pp. $16.99 (paperback). ISBN 9780764331862.

Everybody loves a ghost story, science be damned. Turn on your television and you can shiver along with a half-dozen hit series—*Ghost Hunters* and *Ghost Hunters International* (SciFi); *Ghost Adventures* (Travel Channel); *Ghost Lab* and *A Haunting* (Discovery Channel); and *Paranormal State* (A&E). Today's investigators descend on a house or graveyard and chase ghosts with a truckload of 21st-century toys—hi-def videocams, digital taperecorders, EMF detectors, infrared thermal scanners, thermometers, and walkie-talkies.

Judi Thompson's book features tales from a quainter era when folklorists chased ghosts with a simple notebook and pen. Thompson started collecting her oral histories in 1984 while working as executive editor at the Institute

for Polynesian Studies. Her decades-old stories and accompanying black-and-white photos give off a musty, bygone-era scent, but her scholarship is spiced up by a rich, cultural chop suey of ethnic storytellers.

Native Hawaiians justifiably command center stage in this collection, surprised on a dark road by the volcano goddess Pele and her phantom dog Poki; avoiding danger with the help of *'aumakua* (ancestral spirits) manifesting in the form of a *pueo* (owl) or *mano* (shark); averting their eyes as the legendary Night Marchers, ghostly spirits of Hawaiian warriors, tramp their torchlit, chanting way down the mountains to the ocean along traditional trails—through bedrooms and kitchens of modern buildings unluckily blocking their path. Auntie Harriet Ne of Moloka'i shares with Judi a lifetime of "chicken skin" (pidgin for goose bumps) experiences, including pre–World War II encounters with *menehune*, survivors of the legendary race of small, elfish stonemasons Polynesian voyagers found working fishponds when they first arrived in Hawaii in 500 AD. Kalaupapa leper colony survivors speak cautiously of Moloka'i *kahuna* (priests) who enjoyed a particular reputation as sorcerers of *ana'ana* (black magic), able to tell the future or kill people with evil spells. Both animist Hawaiians as well as Buddhist-believing Japanese immigrants working on the sugar plantations recount witnessing mysterious, floating orbs of light playing in the cane fields—fireballs each group regarded as spirits of the dead (the Nisei called them *sinotama*; the Hawaiians *akualele*). Back in modern Honolulu, Chinese and Portuguese firefighters in the Nu'uanu and Kaka'ako stations reluctantly admit to being attacked by Chokeneck, an evil spirit who yanks off bedsheets, tosses men bodily out of their bunks, and sits on their chest trying to suffocate them while they sleep. To protect themselves, they stuff *ti* leaves under their mattresses (*ti* leaves protect against evil spirits; watch a televised Hawaii football game and you'll see Hawaii fans waving them to ward off touchdowns by their opponents).

Thompson's Hawaii stories echo universally reported paranormal experiences—ghosts, orbs, poltergeists, guardian spirits. Chokeneck matches the Old Hag syndrome. Native Hawaiian scholar Rubelite Johnson, professor of Indo–Pacific languages at the University of Hawaii, shares a family story involving her great-grandmother Ekikela who suffered a classic near-death experience right out of Raymond Moody's *Life After Life*. The old Hawaiians don't bury the body right away; they keep it around for several days since they believe the spirit of the deceased can sometimes be persuaded by offerings or incantations to return to the body. Grandma did just that. She described how she felt ill while working in the garden; collapsed and rose out of her body, traveling upward toward the sunrise (light); came to a partially opened door (barrier); looked inside to see a beautiful, heavenly place; tried to enter but was stopped by a firm hand and a stern voice which told her: "You are not ready

yet. You have to go back to your body"; reluctantly returned to her corpse; wiggled back in through the big toe, then blacked out and re-awoke surrounded by her overjoyed family.

For some unexplained reason, Thompson took 25 years to publish her supernatural stories. During that period, two Hawaii writers beat her to market. Journalist and travel writer Rick Carroll put together his breezy, popular, six-book *Spooky Tales* series. The late American Studies professor and Honolulu Ghost Walks tour operator Dr. Glen Grant tapped a darker vein with his *Obake Files* series (*obake* is Japanese for "ghost"). I admit I got so scared reading one particularly graphic murder/spirit possession case that I threw the book unfinished into the garbage.

Thompson's stories don't deliver the fright of Grant's best, or the easy reads featured in Carroll's collection, but you'll learn a lot about a hidden Hawaii infinitely more entertaining than Don Ho and hokey hulas.

Michael Schmicker
Honolulu, Hawaii
www.redroom.com/author/Michael-L-Schmicker

Further Books of Note

A Zeptospace Odyssey: A Journey into the Physics of the LHC by Gian Francesco Giudice. Oxford University Press, 2010. 256 pp. $45 (hardcover). ISBN 9780199581917.

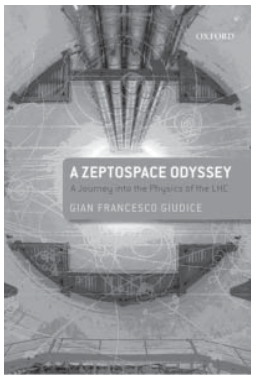
Theoretical physics thrives on the correlations between the simplicity and elegance of a theory on the one hand and its predictive power on the other. These guiding frameworks are strongly imprinted on physicists from their earliest navigations of Newton's calculus through his laws of mechanics, to Maxwell's electrodynamics, and modern physics. Relativity, quantum mechanics, quantum field theory, and the Standard Model, have anchored themselves on relatively simple and elegant basic principles. Not only have these principles reduced and transformed the plethora of data from accelerators (ranging in size from table top to that of rural counties), into well-defined subunits of knowledge, but

they have also connected these units (e.g., molecular physics, atomic physics, nuclear physics, particle physics) by the various facets of the formalism of quantum mechanics, whether applied to particle systems with a small number of degrees of freedom or fields with an infinite number of degrees of freedom. Gian Francesco Giudice's new book, *A Zeptospace Odyssey: A Journey into the Physics of the LHC*, gives an excellent, enjoyable, and highly readable phenomenological and historical account of all these aspects of physics, in particular as they relate to the promise of the world's largest particle accelerator —The Large Hadron Collider (LHC).

Zeptospace refers to the size of the particle structures that this machine is capable of examining, about 100 zeptometers. A zeptometer is equal to a billionth of a billionth of a millimeter. If we compare the size of an atom (on the order of a tenth of a billionth of a meter) to a football field and then enlarge the atom to the size of that same football field, then a zeptometer would, relatively speaking, be on the order of the size of that atom. Overall, zeptospace is much smaller in size, in a manner of speaking, than an atom's atom. Physicists hope to use this supermicroscope to test how far the guiding principles of elegance and simplicity can be extended.

The reader will find each of the three parts of this book enlightening. The first part deals with the various layers of atomic and nuclear structure, paralleling those discussions with the roles of those famous "onion peelers," with names such as Rutherford, Bohr, Pauli, and Dirac, among others. This part also includes a discussion of the four forces of nature, that is, the gravitational, the electromagnetic, and the weak and strong nuclear forces, as well as the famous zoo of elementary particles and their interactions via the last three forces. Then, the author discusses the quantum frameworks that tie these particles and forces together with such names as quantum electrodynamics, the electroweak theory, quantum chromodynamics, and the Standard Model. He uses the biblical story of Jacob's ladder as a metaphor for the study of nature. As we search for ever smaller elementary units of matter (atoms, nuclei, protons and neutrons, electrons and quarks), we see that the apparent complexity of the macroscopic world melts into the simplicity of the hidden fundamental laws. Furthermore, there is an interesting phenomenon associated with the ladder in that each step can be described by a coherent scientific theory with no need of the full knowledge of the other steps. Chemists, for example, do just fine without using the details of quantum chromodynamics. The LHC will take us up one more step beyond the Standard Model of matter as we know it now. As with the other steps, very likely a new revolution in knowledge will result.

The second part of this book deals with the LHC itself, giving us a vivid sense not only of the scale of the machine but also the layers of physics it relies upon. Because of the size and complexity of the accelerator (27 kilometers



around) and the high magnetic fields involved that are needed to produce and tame the energies necessary to probe the next step up the ladder, and the amount of data generated, the frontiers of the corresponding technologies related to superconductivity, detectors, and computer science will go well beyond their old borders. Not since the Apollo Project has a scientific endeavor involved such a burst of new technological marvels. This section of the book goes well beyond expectations in giving the reader a sense of what this next step up the ladder depends upon.

Finally, the third part of the book describes the terrain of the expected new physics and the hope of the solidification of the recently modern physics. With respect to the latter we are taught how the Standard Model accounts for the existence of mass and what famous, so-far-undiscovered particles (mainly the Higgs boson) are expected to be unearthed. The Higgs boson is associated with a fundamental scalar field that produces a medium in which all matter resides. As a result of that medium, the particles take on the well-known properties of inertial mass. But it is the promise of expected new physics, associated with theories that display intrinsic formal attractiveness and simplicity such as supersymmetry, a theory that unites fermions and bosons into one family, that has particle physicists most excited. Related questions are: Why is gravity so incredibly weak compared with the other forces? What is the nature of supersymmetry? Are there higher dimensional spaces, including large extra dimensions, not just the diminutive ones associated with superstrings? And those questions have generated a plethora of theories just begging or daring to be proved wrong.

Supersymmetry involves in one form or another much of the energies of the particle physics community, some would say too much. In the almost 40 years since its birth, there has been no experimental evidence of pairs of particles related by supersymmetry transformations. Will the LHC end this drought and renew the confidence physicists have in their guiding principles of simplicity and elegance? Or will these principles themselves be tested? Of all the concepts tested by the LHC, the one virtually accepted on faith and whose ultimate outcome would cause either great anxiety or enthusiasm is the assumed guide of simplicity and elegance in the theoretical descriptions of new physics as we go up Jacob's ladder.

Horace Crater
Professor of Physics, The University of Tennessee Space Institute
Tullahoma, TN 37388
hcrater@utsi.edu

The Goddess and the Bull—Çatalhöyük: An Archaeological Journey to the Dawn of Civilization by Michael Balter. New York: Free Press, 2005. 400 pp., illus., refs., index. $27.00 (hardcover). ISBN 0743243609.

Science writer Michael Balter's book describes the scientific findings, the stormy history, and the stories of the personnel at Çatal Höyük. Although younger by a millennium or two than Palestine's Jericho or Syria's Abu Hureya, Çatal Höyük (pronounced "*Chah*tahl *Hœ*yuke"), a seventh-to-sixth-millennium-B.C. tell (accretionary-mound) site in Konya Province, Central Turkey, has both revolutionized our understanding of the Near East's Neolithic period and generated much controversy owing to actions and alleged actions on the part of its initial excavator, the British culture/history-oriented James Melaart of London's Institute of Archaeology, as well as to questioned interpretations.

Melaart was convinced that the roots of agriculture-based Western civilization were to be found in Anatolia (Asian Turkey) rather than in Iraqi Mesopotamia, and during his excavations during the 1950s and 1960s Çatal Höyük seemed to give testimony of the potential correctness of this view. At least the site provided unprecedented evidence of early cultic activity. In what Melaart saw as an incipient city, there were ruined shrine rooms whose walls displayed sculpted horned bulls' heads, leopards, and breast-like projections, as well as frescos depicting vultures and other objects. At a slightly later Anatolian site, Hacilar (pronounced "*Hah*jeelar), Melaart had found a plethora of figurines, and he unearthed more at Çatal Höyük. Because of the lack of manifest genitalia on the part of the bulk of these statuettes, he concluded that they depicted females and that they signaled womanly control of religion as well as a matriarchal society. These figurines and Melaart's ideas about them captured public attention as well as the academic eye; some scholars—especially UCLA archaeologist Marija Gimbutas—elaborated the concept of a peaceful, pre-patriarchal, goddess-oriented matriarchy—which fit cozily with then-emergent feminist and New Age notions (as Balter's book describes, Çatal Höyük became *the* Mecca for New Age goddess-worshipers).

Remains at Çatal Höyük indicated use of a variety of wild and cultivated plants as well as wild and presumed domesticated cattle. The town seemed likely to have prospered, too, from trade in obsidian obtained at a not-too-distant volcanic mountain, and the settlement boasted a population of between 3,000 and 8,000.

During his time in Turkey, Melaart published on fabulous Bronze Age antiquities that he said he had seen in a private collection in the town of Dorak. Government authorities—perhaps motivated in part by envy of the fame that the archaeologist had garnered from his work in their country—alleged that he was complicit in the illegal export of antiquities, allegations for which

there was no credible evidence but which led to his being banned from directing further archaeological activity in the country. Too, late in his career Melaart published scientific illustrations purported to represent Çatal Höyük frescos depicting kilims (flat-woven rugs/hangings). Weavers, rug experts, and many archaeologists expressed extreme skepticism, and later work at the site has failed to confirm that such frescoes really existed there. Melaart could produce no photographs of the murals, stating that they had all perished in a fire.

In 1993, a British team under the University of Cambridge archaeologist Ian Hodder was permitted to resume excavations at Çatal Höyük and to apply contemporary scientific techniques. Hodder had been intellectually raised during the ascendency of the "new," "processual," anti-culture/history brand of archaeology in vogue during the 1960s and 1970s, which considered all cultural content to be adaptive to environment and to be susceptible to explanation via the formulating and testing of scientifically expressed hypotheses. Hodder finally came to realize (what had been well-recognized long prior to Processualism but which had subsequently been shoved under the rug) that human culture was not merely environmentally adaptive but was a partially independent phenomenon in its own right that included beliefs and values that had little or nothing to do with adaptation and could not be accounted for by any utilitarian theory. In 1982, Hodder launched "post-Processual archaeology," which 1) eschewed the logical positivism of New Archaeology, 2) attempted to blend historical particularism with overarching theory, and 3) promoted a somewhat postmodernist "multivocality" (accommodation of a variety of archaeological orientations) as well as continuous self-criticism.

As an aside, the New Archaeologists were sometimes quite aggressive when their premises were questioned. The University of Chicago Processualist guru Lewis Binford said to one Hodder student who had raised questions concerning Binford's Processualist ideas, "You'll find out what natural selection means when you try to get a job, buddy boy!" (p. 80).

During the ongoing dig at Çatal Höyük, with the help of a variety of specialists Hodder generated great quantities of new data and drew upon these to reassess Melaart's ideas. Hodder's team, which from 1997 included prominent UC Berkeley archaeologist Ruth Tringham, found indications that the settlement had been a large and elaborate village rather than a functionally differentiated city and that Melaart's "shrine" rooms had begun as dwelling rooms but had later became shrines following one or more subfloor burials.

The archaeologists came to question that the "female" figurines reflected goddess-oriented worship and matriarchy: Most figurines were of ambiguous sex and had not been deposited in special places or with discernable reverence. Domesticated sheep and goat bones proved to outnumber (wild) cattle bones five-and-a-quarter to one, contradicting the earlier conclusion of dependence on domestic cattle.

Although sedantism in permanent villages had once been thought to have developed hand in hand with the emergence of agriculture, sedantism and a variety of other cultural developments pre-date farming at this site, as they are now known to do widely in the Near East. This pre-farming cultural elaboration has recently been underlined by the recognition and excavation of tenth-millennium–B.C. Gölbekli Tepe in southeastern Turkey, an amazing presumed ceremonial site featuring impressive sculpted T-shaped megaliths erected by a seemingly nomadic, pre-agricultural people (Schmidt, 2006, Scham, 2008, Chandler & Çagatay, 2009).

The transition from the pre-farming but sedentary Natufian culture to an agricultural Neolithic lifeway took place in the region about 11,000 years ago, during a cool, dry period known as the Younger Dryas. This subsistence transition, possibly commencing as an effort to maintain food supply under the relatively harsh new climatic conditions, saw the inception of the raising of wheat, barley, and legumes, supplemented by the continued gathering of edible wild plants. There also occurred a change (for debated reasons) from round to rectangular dwellings, with aurochs (wild cattle) heads, horns, and other parts embedded in house walls and floors at Çatal Höyük, perhaps reflecting a symbolic transformation of fearsome wild bulls into an aspect of a secure domestic setting.

At this time, a revolution in symbols, not tools, took place, reflecting a change in beliefs rather than in most technology; "goddess" and bull iconography flourished, and ritual became increasingly important and complex. Çatal Höyük's location on a marshy floodplain, at a minimum of 11 kilometers (7 miles) from farmable land and from timber for roofing, is explicable, thinks Hodder, on the basis of local availability of fine clay for repeated painted-wall plasterings and for figurine manufacture—another instance of culture, especially religion and ritual, being more determinative than are adaptive subsistence economics.[1]

Note

[1] This review also appears in the 2008–2010 issue of *Pre-Columbiana: A Journal of Long-Distance Contacts, 4*(3&4)/*5*(1).

Stephen C. Jett
Professor Emeritus of Geography and of Textiles and Clothing
University of California, Davis
scjett@hotmail.com

References

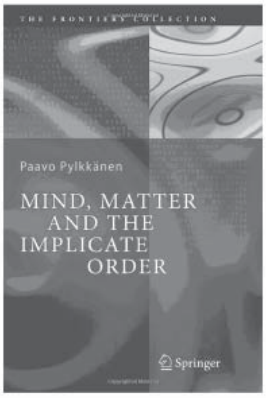
Chandler, G., & Çagatay, E. (2009). The beginning of the end for hunter–gatherers. *Saudi Aramco World, 60*(2), 2–9. http://www.saudiaramcoworld.com/issue/200902/the.beginning.of.the.end.for.hunter-gatherers.htm

Scham, S. (2008). The world's first temple: Turkey's 12,000-year-old stone circles were the spiritual center of a nomadic people. *Archaeology, 61*(6), 22–27.

Schmidt, K. (2006). *Sie bauten die ersten Tempel. Das rätselhafte Heiligtum der Steinzeitjäger.* Munich: Verlag C. H. Beck. [English edition to be published by Oxbow Books.]

Mind, Matter, and the Implicate Order by Paavo T. I. Pylkkänen. Springer, 2010. 271 pp. $99 (hardcover). ISBN 978-3642062865.

A new and welcome addition to Springer's Frontiers Collection of physics monographs is Paavo Pylkkänen's *Mind, Matter, and the Implicate Order.* This treatise, an extention of Pylkkänen's 1992 doctoral dissertation, explores "the nature of mind and its relationship to matter; the nature of time, both physical and mental," as illuminated by David Bohm's interpretation of quantum mechanics, and in particular,through his notion of implicate order, by which "the whole universe is in some way enfolded in everything and that each thing is enfolded in the whole." In other words, "there is a sense in which each region or 'part' of the universe enfolds information about the whole universe." As counterintuitive as this holistic viewpoint might first appear, it echoes the notion of global entanglement, which seems to be intrinsic to orthodox quantum mechanics itself. Pylkkänen approaches the mind–matter problem—which has bedeviled Western philosophy and been virtually ignored by Western science for centuries—through this Bohmian lens. The discussion, more philosophy than physics, and virtually devoid of mathematics, is compelling and should be accessible both to laymen and specialists. The mind–matter problem is certainly not settled in this monograph—after all, Bohm's is but one of more than a dozen legitmate interpretations of quantum mechanics—however, it is a clear, cogent exposition that should be of interest to philosophers of science, scientists, and anyone interested in the nature of reality and our relationship to it.



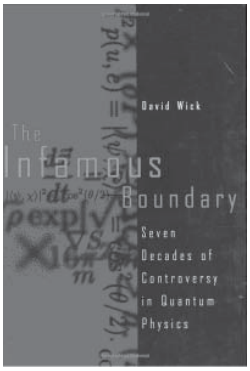
Daniel Sheehan
dsheehan@sandiego.edu

The Infamous Boundary: Seven Decades of Controversy in Quantum Physics by David Wick. Birkhäuser, 1995. 332 pp. $79.95 (hardcover). $19 (paperback). $16.25 (Kindle). ISBN 978-0817637859.

Does quantum mechanics mean that sub-atomic events are uncertain until a wave function collapses? Is a consciousness required to collapse the wave function? How to interpret such a conversion of probability to certainty: Does it mean that every wave-function collapse is also a splitting off of a new universe in which the other possibility occurred?

The Infamous Boundary discusses those and related questions. The book's title refers to the fact that macroscopic events can be understood in commonsense ways whereas sub-atomic events have to be handled mathematically via quantum mechanics and the associated mind-boggling questions. Where is the boundary between those two domains? How does probabilistic uncertainty become macroscopic determinism, and at what scale?

A second boundary is that between the discrete-ness of quantum mechanics and non-discrete relativity theory. The decades-long quest for a theory to unify those remains without success.



David Wick intended this book to be accessible to non-specialists interested in these matters. I think he succeeded, though one does need to think hard in some places. However, I gained from this reading not some great insight into the technicalities but, much more satisfying, the realization that the specialists themselves are at sea in these deep waters, and that there has never emerged a consensus about how to interpret wave-function collapses or whether a deterministic hidden-variable theory remains to be discovered. Quantum mechanics is extremely successful as a means of calculating what happens, but there is no associated meaning—no agreed meaning—in physical terms. It is a relief to be told that when I don't understand how consciousness could collapse wave functions—Was there a world before people? Is there a universal consciousness? If so, how does our consciousness relate to it?—or how there could be an infinite infinity of universes, and so on, that I am in the company of Bell, Bohr, Bohm, Einstein, Feynman, Heisenberg, Wigner, etc., who didn't understand those things either and didn't agree about them among their expert selves.

Henry H. Bauer
Professor Emeritus of Chemistry & Science Studies
Dean Emeritus of Arts & Sciences
Virginia Polytechnic Institute & State University
hhbauer@vt.edu
www.henryhbauer.homestead.com

Article of Interest

New Evidence for a 67,000-Year-Old Human Presence at Callao Cave, Luzon, Philippines, by Armand Salvador Mijares, Florent Détroit, Phillip Piper, Rainer Grün, Peter Bellwood, Maxime Aubert, Guillaume Champion, Nida Cuevas, Alexandra De Leon, and Eusabio Dizon. *Journal of Human Evolution, 58*(1) (2010):123–132.

In 2007, a small third metatarsal from a human was found in a cave in northern Luzon, dated to some 67,000 years ago. Despite some differences, the bone most resembles those of recent short, gracile Negritos (some of whom still live nearby), although in size it also overlaps those of Flores Island's *Homo floresiensis* (the "Hobbit"). This footbone may, then, be the oldest remains of *H. sapiens* found to the east of Wallace's Line (the farthest-eastward limit of the Asian continent at lowest Pleistocene sea levels). If a proto-Negrito is represented by the metatarsal, this would be compatible with the hypothesis, based on geographical distribution and simplicity of culture, that pygmy-like proto-Negritos were the original anatomically modern humans to spread, probably coastally, from Africa into Asia and on into Australia. Since Luzon was never attached to the Asian mainland, the bone "further demonstrates the abilities of humans to make open ocean crossings in the Late Pleistocene" (p. 123). Human remains from Lake Mungo, Australia, date to 40,000 ± 2,000 years ago. Indonesia's island of Flores has not only 18,000–38,000-year-old *H. floresiensis* remains but also stone tools dating to more than 800,000 years ago—which would be very much older than the emergence of *H. sapiens*; only pre-*sapiens Homo erectus* would seem to be a candidate as the Flores tool-maker. Not many years ago, it was thought that humans had not been able to cross wide water gaps until quite late in their history, but the last few decades have seen a revolution in the evidence, which now suggests that people were, in many areas, quite mobile, reaching even some quite distant islands tens of thousands of years ago.

Stephen C. Jett
Professor Emeritus of Geography and of Textiles and Clothing
University of California, Davis
scjett@hotmail.com

Society for Scientific Exploration

30th Annual Meeting

SOCIETY FOR SCIENTIFIC EXPLORATION

Boulder Colorado, June 9–11, 2011

Millennium Harvest Host Hotel

The SSE at the Forefront of Science

IMPLICATIONS OF NON-LOCALITY
Larry Dossey
Pamela Rae Heath

THE SCIENCE OF THE SUBJECTIVE
Robert Jahn & Brenda Dunne
Dean Radin

CONSCIOUSNESS AND LIVING SYSTEMS
Rollin McCraty
Larissa Cheran

PRACTICAL APPLICATIONS OF ANOMALIES RESEARCH
Francesca McCartney
John McMichael

THE SOCIOLOGY OF SCIENTIFIC EVOLUTION
Walter Cruttenden
Jonathan Schooler

register at www.ScientificExploration.org

54th Annual Parapsychological Association Convention
Curitiba, Brazil, August 18–21, 2011

Deadline for submissions: Monday, April 11, 2011, electronic submission only to m.kittenis@aston.ac.uk. Abstracts of all accepted submissions other than workshops will be included in the convention booklet. Dr. Marios Kittenis, Psychology, School of Life and Health Sciences, Aston University, Birmingham, B4 7ET, UK +44 121 204 3000 ext. 4318.

Preparation of Submissions: Include an Abstract (with no references in it)
http://www.parapsych.org/downloads/Convention_Submissions_Template.docm.
http://www.parapsych.org/downloads/PA_Convention_Abstracts_Template.docm.

Robert L. Morris Student Travel Grant Program http://www.parapsych.org/grants.html

Index of Previous Articles in the *Journal of Scientific Exploration*

Vol: No	Article	Author(s)
1:1	A Brief History of the Society for Scientific Exploration	P. Sturrock
	Aterations in Recollection of Unusual and Unexpected Events	D. Hall et al.
	Toward a Quantitative Theory of Intellectual Discovery (Esp. in Phys.)	R. Fowler
	Engineering Anomalies Research	R. Jahn et al.
	Common Knowledge about the Loch Ness Monster	H. Bauer
	An Analysis of the Condon Report on the Colorado UFO Project	P. Sturrock
1:2	The Strange Properties of Psychokinesis	H. Schmidt
	What Do We Mean by "Scientific?"	H. Bauer
	Analysis of a UFO Photograph	R. Haines
	Periodically Flashing Lights Filmed off the Coast of New Zealand	B. Maccabee
2:1	Commonalities in Arguments over Anomalies	H. Bauer
	Remote Viewing and Computer Communications—An Experiment	J. Vallee
	Is There a Mars Effect?	M. Gauquelin
	Raising the Hurdle for the Athletes' Mars Effect	S. Ertel
2:2	UFOs and NASA	R. Henry
	The Nature of Time	Y. Terzian
	Operator-Related Anomalies in a Random Mechanical Cascade	B. Dunne et al.
	Evidence for a Short-Period Internal Clock in Humans	T. Slanger
	Three New Cases of Reincarnation Types in Sri Lanka with Written Records	I. Stevenson et al.
3:1	Arguments Over Anomalies: H. \?Polemics	H. Bauer
	Anomalies: Analysis and Aesthetics	R. Jahn
	Trends in the Study of Out-of-Body Experiences	C. Alvarado
	A Methodology for the Objective Study of Transpersonal Imagery	W. Braud/ M. Schlitz
	The Influence of Intention on Random and Pseudorandom Events	D. Radin/J. Utts
	Case of Possession Type in India with Evidence of Paranormal Knowledge	I. Stevenson et al.
3:2	New Ideas in Science	T. Gold
	Photo Analysis of an Aerial Disc Over Costa Rica	R. Haines/J. Vallee
	Three Cases of Children in Northern India Who Remember a Previous Life	A. Mills
	"Signatures" in Anomalous Human–Machine Interaction Data	D. Radin
	A Case of Severe Birth Defects Possibly Due to Cursing	I. Stevenson
4:1	Biochemical Traumatology/Plant Metabolic Disorders in a UFO Landing	M. Bounias
	Return to Trans-en-Provence	J. Vallee
	Analysis of Anomalous Physical Traces: 1981 Trans-en-Provence UFO Case	J. Velasco
	Physical Interpretation of Very Small Concentrations	H. Bauer
	Luminous Phenomena and Seismic Energy in the Central United States	J. Derr/ M. Persinger
	Photo Analysis of an Aerial Disc Over Costa Rica: New Evidence	R. Haines/J. Vallee
	A Scientific Inquiry into the Validity of Astrology	J. McGrew/ R. McFall
	Planetary Influences on Human Behavior: Absurd for a Scientific Explanation?	A. Müller
	Five Arguments against Extraterrestrial Origin of Unidentified Flying Objects	J. Vallee
4:2	Using the Study of Anomalies To Enhance Critical Thinking in the Classroom	M. Swords
	Observations of Electromagnetic Signals Prior to California Earthquakes	M. Adams
	Bayesian Analysis of Random Event Generator Data	W. Jefferys
	Moslem Case of Reincarnation Type in Northern India: Analysis of 26 Cases	A. Mills
	Electromagnetic Disturbances Associated with Earthquakes	M. Parrot
	Extrasensory Interactions between Homo Sapiens and Microbes	C. Pleass/N. Dey
	Correlation between Mental Processes and External Random Events	H. Schmidt
	Phobias in Children Who Claim To Remember Previous Lives	I. Stevenson
	A Gas Discharge Device for Investigating Focused Human Attention	W. Tiller

JOURNAL OF SCIENTIFIC EXPLORATION

ORDER FORM FOR 2008 and 2009 PRINT ISSUES

JSE Volumes 1–21 are available FREE at scientificexploration.org
(JSE Vol. 22–25 are free to SSE members at http://journalofscientificexploration.org/index.php/jse/login)
JSE Print Volumes 22–25 (2008–current) are available for $20/issue; use form below.

Year	Volume	Issue	Price ×	Quantity	= Amount
			$20		
Postage is included in the fee.					
				ENCLOSED	

Name

Address

Phone/Fax

Send to: SSE
151 Petaluma Blvd. S. #228
Petaluma CA 94952

Fax (1) (707) 559-5030
EricksonEditorial@att.net
Phone (1) (415) 435-1604

☐ I am enclosing a check or money order

☐ Please charge my credit card as follows: ☐ VISA ☐ MASTERCARD

Card Number | Expiration

Signature

☐ Send me information on the Society for Scientific Exploration

JOURNAL OF
SCIENTIFIC EXPLORATION

GIFT ISSUES AND SUBSCRIPTIONS

Single Issue: A single copy of this issue can be purchased from SSE.
See order form on previous page.
Price: $20.00

Subscription: To send a gift subscription, fill out the form below.
Price: $75 (online)/135(print) for an individual
$135 for for a library/institution/business, $195 for print

Gift Recipient Name _____
Gift Recipient Address _____
_____
Email Address of Recipient for publications_____

- ☐ I wish to purchase a single copy of this issue.
- ☐ I wish to remain anonymous to the gift recipient.
- ☐ I wish to give a gift subscription to a library chosen by SSE.
- ☐ I wish to give myself a subscription.
- ☐ I wish to join SSE as an Associate Member for $75/yr or $135/yr (print), and receive this quarterly journal (plus the EdgeScience magazine and The Explorer newsletter).

Your Name _____
Your Address _____
_____

Send this form to: *Journal of Scientific Exploration*
Society for Scientific Exploration
151 Petaluma Blvd. S., #228
Petaluma CA 94952 USA

Fax (1) (707) 559-5030
EricksonEditorial@att.net
Phone (1) (415) 435-1604

For more information about the Journal *and the Society, go to*
http://www.scientificexploration.org

SOCIETY FOR
SCIENTIFIC EXPLORATION

JOIN THE SOCIETY AS A MEMBER

The Society for Scientific Exploration has four member types:

Associate Member ($75/year with online Journal; $135 for print Journal): Anyone who supports the goals of the Society is welcome. No application material is required.

Student Member ($35/year includes online Journal; $95/year print Journal): Send proof of enrollment in an accredited educational institution.

Full Member ($95/year for online Journal; $155/year for Print Journal): Full Members may vote in SSE elections, hold office in SSE, and present papers at annual meetings. Full Members are scientists or other scholars who have an established reputation in their field of study. Most Full Members have: a) doctoral degree or equivalent; b) appointment at a university, college, or other research institution; and c) a record of publication in the traditional scholarly literature. Application material required: 1) Your curriculum vitae; 2) Bibliography of your publications; 2) Supporting statement by a Full SSE member; or the name of Full SSE member we may contact for support of your application. Send application materials to SSE Secretary Mark Urban-Lurain, urban@msu.edu

Emeritus Member ($75/year with online Journal; $135/year with Print Journal): Full Members who are now retired persons may apply for Emeritus Status. Please send birth year, retirement year, and institution/company retired from.

All SSE members receive: online quarterly *Journal of Scientific Exploration* (*JSE*), online SSE Member Directory, quarterly *EdgeScience* online magazine, *The Explorer* online newsletter, notices of meetings, access to SSE online services, searchable *Journal* articles from 2008–2010 on the JSE site by member password and for all 25 years on the SSE site.

Your Name _____

_____

Email_____

Phone_____ Fax_____

Payment of _____ enclosed, *or*

Charge My VISA ☐ Mastercard ☐

Card Number _____ Expiration_____

Send this form to:

Society for Scientific Exploration
151 Petaluma Blvd. S., #228
Petaluma CA 94952 USA

Fax (1) (707) 559-5030
EricksonEditorial@att.net
Phone (1) (415) 435-1604

For more information about the Journal *and the Society, go to*
http://www.scientificexploration.org

JOURNAL OF SCIENTIFIC EXPLORATION
A Publication of the Society for Scientific Exploration

Instructions to Authors
(Revised March 2010)

All correspondence and submissions should be directed to:

JSE Managing Editor, 151 Petaluma Blvd. S., #228, Petaluma CA 94952 USA, EricksonEditorial@att.net, (1) 415/435-1604, *fax* (1) 707/559-5030

Please submit all manuscripts at http://journalofscientificexploration.org/index.php/jse/login (please note that "www" is NOT used in this address). This website provides directions for author registration and online submission of manuscripts. Full author's instructions are posted on the Society for Scientific Exploration's website, at http://www.scientificexploration.org/jse/author_instr.php for submission of items for publication in the *Journal of Scientific Exploration*. Before you submit a paper, please familiarize yourself with the *Journal* by reading articles from a recent issue. (Back issues can be ordered from SSE Treasurer John Reed at joreed43@yahoo.com, or by using the order form in the back of this issue.) Electronic files of text, tables, and figures at resolution of a minimum of 300 dpi (TIF preferred) will be required for online submission. You will also need to attest to a statement online that the article has not been previously published or posted on the Internet and that it is not currently submitted elsewhere for publication.

AIMS AND SCOPE: The *Journal of Scientific Exploration* publishes material consistent with the Society's mission: to provide a professional forum for critical discussion of topics that are for various reasons ignored or studied inadequately within mainstream science, and to promote improved understanding of social and intellectual factors that limit the scope of scientific inquiry. Topics of interest cover a wide spectrum, ranging from apparent anomalies in well-established disciplines to paradoxical phenomena that seem to belong to no established discipline, as well as philosophical issues about the connections among disciplines. The *Journal* publishes research articles, review articles, essays, book reviews, and letters or commentaries pertaining to previously published material.

REFEREEING: Manuscripts will be sent to one or more referees at the discretion of the Editor-in-Chief. Reviewers are given the option of providing an anonymous report or a signed report.

In established disciplines, concordance with accepted disciplinary paradigms is the chief guide in evaluating material for scholarly publication. On many of the matters of interest to the Society for Scientific Exploration, however, consensus does not prevail. Therefore the *Journal of Scientific Exploration* necessarily publishes claimed observations and proffered explanations that will seem more speculative or less plausible than those appearing in some mainstream disciplinary journals. Nevertheless, those observations and explanations must conform to rigorous standards of observational techniques and logical argument.

If publication is deemed warranted but there remain points of disagreement between authors and referee(s), the reviewer(s) may be given the option of having their opinion(s) published along with the article, subject to the Editor-in-Chief's judgment as to length, wording, and the like. The publication of such critical reviews is intended to encourage debate and discussion of controversial issues, since such debate and discussion offer the only path toward eventual resolution and consensus.

LETTERS TO THE EDITOR intended for publication should be clearly identified as such. They should be directed strictly to the point at issue, as concisely as possible, and will be published, possibly in edited form, at the discretion of the Editor-in-Chief.

PROOFS AND FINAL PDFs: After reviewing their copyedited manuscript, corresponding authors will receive typeset PDF page proofs for review. PDFs of the final published online/print version will be available to all named authors of an article.

COPYRIGHT: Authors retain copyright to their writings. However, when an article has been submitted to the *Journal of Scientific Exploration* for consideration, the *Journal* holds first serial (periodical) publication rights. Additionally, after acceptance and publication, the Society has the right to post the article on the Internet and to make it available via electronic as well as print subscription. The material must not appear anywhere else (including on an Internet website) until it has been published by the *Journal* (or rejected for publication). After publication in the *Journal*, authors may use the material as they wish but should make appropriate reference to the prior publication in the *Journal*. For example: "Reprinted from [or From] "[title of article]", *Journal of Scientific Exploration*, vol. [xx], no. [xx], pp. [xx], published by the Society for Scientific Exploration, http://www.scientificexploration.org."

DISCLAIMER: While every effort is made by the Publisher, Editors, and Editorial Board to see that no inaccurate or misleading data, opinion, or statement appears in this *Journal*, they wish to point out that the data and opinions appearing in the articles and announcements herein are the sole responsibility of the contributor concerned. The Publisher, Editors, Editorial Board, and their respective employees, officers, and agents accept no responsibility or liability for the consequences of any such inaccurate or misleading data, opinion, or statement.