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## JOURNAL OF SCIENTIFIC EXPLORATION

A Publication of the Society for Scientific Exploration

**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, commentaries, guest editorials, historical perspectives, obituaries, book reviews, and letters or commentaries pertaining to previously published material.



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## EDITORIAL

The 2014 SSE Conference near San Francisco is now behind us, and I'd rate it as quite successful. Apart from the predictable good times shared with friends whom we see only at these get-togethers, several things in particular stood out for me. First, Gerald Pollack's Dinsdale lecture on the fourth phase of water was unusually interesting, and in fact all the invited talks were both stimulating and entertainingly presented. (Kudos again to Adam Curry for putting together a really first-rate program, and to Jerry Gin for doing such a wonderful job as local host.) Although I wasn't monitoring the behavior of attendees generally or invited speakers in particular, I happened to sit near or next to Gerald Pollack for much of the meeting. And I have to say that I was also struck and impressed by his attentiveness and openness to the rest of the program. If he missed a presentation, I didn't see it, and I believe he took careful notes of most (if not all) of the talks as well. I doubt this was a mere courtesy. I believe Pollack exemplifies the kind of inquisitiveness, open-mindedness, and intellectual courage I at least take to be a prerequisite for membership in the SSE, but which one sees all too infrequently in the Academy, or in the real world generally.

Moreover, the conference was quite well-attended, and I was pleased (and somewhat surprised) that many of those present don't yet qualify for membership in the AARP.<sup>1</sup> The shortage of "young blood" has been a concern, not just for the SSE, but also for other similarly minded organizations to which I belong (e.g., the Parapsychological Association and the Society for Psychical Research)<sup>2</sup>. Indeed, the SSE Council routinely considers ways to encourage the recruitment and participation of new and young members. Brenda Dunne has certainly helped with this by organizing and hosting the New Members and Young Investigators meetings at the annual conferences, and my spies informed me that this year's meeting was again a success (and not just because the pizza was very good).

Despite the encouraging numbers of young(ish) attendees, the SSE Council remains concerned about the relative dearth of younger members, and it also remains uncertain about the reasons for this and the best ways to remedy the situation. Are the obstacles at least partly financial? Are the costs for attending the conference (especially when out of state) simply prohibitive for most students, as well as for relatively impecunious graduates clinging perilously but tenaciously to their positions in the workforce? It would hardly be surprising if that's the case. Similarly, as far as student membership is concerned, I imagine that many (if not most)

academic environments thwart or suppress students' interest in areas of frontier science and that many students simply have few if any conventional ways (except self-directed Internet searches) for learning about the SSE and similar organizations. I know, for example, that members of the University of Maryland Baltimore County Psychology Department often threatened students with reprisals if they attended my annual seminar on Philosophy and Parapsychology. And there's no reason to think that situation was unprecedented; irrational academic resistance to areas of frontier science is—disgracefully—too well-documented to deny.

However, I believe there's something most SSE members can do to recruit new and young blood into the Society. I regularly receive inquiries from people who ran across something about my work and write me with questions or anecdotes. And I'm sure many other SSE members have had similar experiences. These are golden opportunities to spread the word about the SSE, direct our correspondents to the SSE and *JSE* web pages, and emphasize that all but the most recent *JSE* issues are available for free download. Moreover, since some SSE members are very well-known and no doubt regularly receive unsolicited inquiries from strangers (if not anomalies researcher stalkers), information of this sort has a chance of being disseminated quite widely. Similarly, occasional mention of the SSE or *JSE* on Facebook and other social media sites has the chance of reaching many who might not otherwise have known about these resources. I'm realistic enough to recognize that these efforts probably won't lead to a huge increase in SSE membership or SSE conference attendance. But the effort required on our parts is minimal; so why not try?

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On another matter, I'm sad to report that our long-time Book Review Editor, David Moncrief, has resigned his position. David began as sole BRE back in 2001 and has done an absolutely astonishing job in that role. Indeed, I doubt seriously that we can find a person who has anything close to David's breadth and depth of familiarity with the broad range of topics of interest to SSE members and with the community of scholars engaged in the study of scientific anomalies. At the moment we have no replacement for David, and the most satisfactory plan B I've been able to conceive is to ask my team of Associate Editors to suggest books for review and to help recruit reviewers. That says it all, I think. The only way I know to adequately replace David is with the combined resources of a dozen other people. In the meantime, I'll be happy to entertain applications from anyone interested in the job. But be warned, you'll have very big shoes to fill.

**STEPHEN BRAUDE**

**Notes**

- <sup>1</sup> For readers outside the U.S. that's the nonprofit American Association of Retired Persons (AARP), with a membership of 37 million people. One needn't be retired to belong, but one usually must be at least 50 years old.
- <sup>2</sup> I don't include here the American Philosophical Association, which does have many young members, and whose primary criteria for membership are to be a scruffy dresser and very stingy when dispensing gratuities.

## RESEARCH ARTICLE

### Anomalous ‘Retrocausal’ Effects on Performance in a Go/NoGo Task

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**Abstract**—Retroactive effects were investigated in the context of a Go/NoGo task. Performance differences between rational and intuitive thinkers also were investigated. Participants were presented with a shape and instructed to either respond or not respond, depending on the shape. In the first Go/NoGo task, the subject had to respond to two shapes that were randomly chosen out of four shapes. In the second Go/NoGo task, participants only had to respond to one shape. This shape was randomly chosen from the two that were used as Go-signals in the first Go/NoGo task. In accordance with the growing literature on retroactive influences on cognition and emotions, where future events seem to have an anomalous, retroactive influence on responses and behavior in the present, we predicted that the second Go/NoGo task would have a practice effect on performance during the first task. We also predicted that this effect would be stronger for subjects classified as “intuitive thinkers” based on the Human Information Processing questionnaire. These predictions were confirmed. During the first Go/NoGo task, the subjects responded ~2% faster to the (target) shape—which they also had to react to during the second task—than to the (control) shape they only had to respond to during the first task ( $t = 2.59$ ,  $df = 66$ ,  $p = 0.024$ ). Subjects with an intuitive thinking style were totally responsible for the whole effect (“intuitive” thinkers alone:  $t = 3.41$ ,  $df = 34$ ,  $p < 0.001$ ). Explorations of the HIP-questionnaire subscales suggest that the relation between anomalous performance and Human Information Processing style is mostly caused by a factor we label as “rigidity.” We also discuss how “Questionable Research Practices” could have contributed to the current results.

#### Introduction

##### ***Retroactive Influences***

Recently, there have been multiple studies on retroactive influences on cognition, where future events seem to have an anomalous, retroactive influence on responses made in the present (Bem 2011). One example of this that has received quite some attention in the last decades is presentiment:



Multiple studies have shown that certain measures of arousal (galvanic skin response, heart rate, etc.) can show an increase a short time before the actual onset of a random arousing stimulus (e.g., Bierman & Radin 1997, Bierman & Scholte 2002, Mossbridge, Tressoldi, & Utts 2012). Such results suggest that information concerning a stimulus can actually go back in time (from milliseconds to seconds), although it might be more precise to say that the present apparently is dependent on the past and, to a much smaller degree, on unknown future conditions. Another example of this same phenomenon is retroactive priming, where primes shown after the target stimulus have an effect on the response latency for that stimulus (e.g., de Boer & Bierman 2006, Bem 2011).

A further example of this phenomenon that shows said anomalous retroactive effects even earlier (multiple minutes back in time) is retroactive practice or learning (e.g., Franklin & Schooler 2011a, 2011b). Simply put, it is conventional practice turned around. Studying for an exam is a good example: Normally, studying before an exam influences one's performance during that subsequent exam. According to the theory of retroactive influences, it would theoretically be possible to influence one's performance on an exam by studying for it after it has taken place.

Some of the above-mentioned studies will now be described in more detail. Bem (2011) did a study, consisting of nine separate experiments, on precognition and premonition, with two examples of a more general phenomenon: the retroactive, anomalous influence of a future event on a person's current responses. All but one of these experiments yielded significant results, supporting these retroactive effects. One of these experiments, for example, was a reversed priming experiment: Participants judged pictures as being either pleasant or unpleasant. After being shown a picture, instead of before as in a regular priming experiment, a congruent or incongruent word would quickly be shown. Participants responded significantly faster in congruent trials than in incongruent trials.

It should be mentioned that this study has attracted strong criticism. A good example of such criticism is from Wagenmakers, Wetzels, Borsboom, and van der Maas (2011), who call upon Bayesian statistics in an attempt to weaken Bem's results. The points they and others have raised are either incorrect or applicable to statistics in experimental psychology in general. An issue that has hardly been raised in the discussion of Bem's and similar anomalous results is whether the use of Questionable Research Practices can account for these results. A number of meta-analytic results in the field of experimental parapsychology show consistent and significant effects (often larger than 6-sigma). Small effects induced by questionable research practices in individual studies, however, can of course build up to large

meta-analytic effects. Recent simulations of so-called Ganzfeld telepathy experiments show that about 40% of the reported meta-analytic effect-size can be accounted for by these practices (Bierman & Bijl 2014, in preparation).

In studies such as those mentioned above, where anomalous retroactive influences are tested, it is essential that the future condition that is supposed to “influence the past” is chosen randomly. If that condition is not met, then normal inferential processes about the future might have caused the current performance in the present. In studies such as those mentioned above (and in the current experiment as well), the selection of the future condition is generally based upon the outcome of an electronic or software-based random number generator. Franklin & Schooler (2011a, 2011b), however, conducted multiple experiments (yet to be published) where they used the above-mentioned retroactive practice effect to predict real world events (in this case, the spin of a roulette wheel). To do this, they used a setup similar to the one used in the current experiment: During two subsequent Go/NoGo tasks, subjects were asked to respond to a stimulus that appeared on the screen. During the first Go/NoGo task, subjects pressed a button for two shapes (the Go-shapes) randomly selected from four. For the two other (NoGo) shapes, subjects had to withhold a response. During the second Go/NoGo task, subjects only had to react to one of these two Go-shapes from the first task. This shape is also referred to as the target-shape. The choice of target-shape was determined by the spin of a roulette wheel.

If their response during the first task was quicker for Go-shape A than for Go-shape B, the experimenters assumed that shape A would be the one chosen by the random decision of the roulette wheel (to be used again as the target-shape during the second Go/NoGo task). In this manner, they were able to infer the future outcome of the roulette wheel just by looking at the results during the first Go/NoGo task. Their results were a bit less straightforward than a superior performance during the first task for the shape exercised during the second task. During the final experiment, they achieved a success rate of 57% ( $N = 111$ ,  $p = 0.062$ ) in predicting these roulette outcomes.

The Consciousness Induced Restoration of Time Symmetry model (CIRTS) (Bierman 2010) is based upon the fact that time-symmetry is intrinsic in almost all formalisms of theoretical physics. Apparently, this symmetry has been broken for most physical systems. It is assumed that under specific information processing conditions, this symmetry is partly restored. In that case, one would expect correlations that appear to be retrocausal. The particular context that restores symmetry is that information is processed by a multi-particle system like our brains. This also introduces

the single parameter that can account for individual differences, namely the coherence of the brain. It is argued that intuitive participants have a more global and spontaneous type of information-processing than more rational (serial-thinking) participants, and therefore CIRTS would predict a larger retrocausal effect for “intuitive” participants.

The current study was designed to replicate the anomalous retroactive practice effects reported by Franklin & Schooler (2011a, 2011b).<sup>1</sup>

### **Research Question**

We investigated whether future practice can affect performance in the present. We compared this effect for intuitive and rational thinkers, expecting the effect to be larger for the former.

### **Hypotheses**

We used the same design as the Go/NoGo experiment by Franklin and Schooler described above, with the exception that we didn’t use a roulette wheel as a randomizing device, but rather the built-in random function of “Visual Basic.” This study must therefore be treated as a confirmatory experiment.

- Hypothesis I: The second Go/NoGo task will have a training effect on performance in terms of response times during the first Go/NoGo task. More specifically, assuming the two Go-shapes in the first task are “A” and “B,” and assuming that the Go-shape in the second task is “A” (aka the target-shape), we predict that subjects will respond faster to A than to B during the first task (and vice-versa for subjects who have to respond to target-shape B in the second task).
- Hypothesis II: Subjects with an intuitive thinking style will show a larger retrocausal effect than subjects with a rational thinking style.

## **Method**

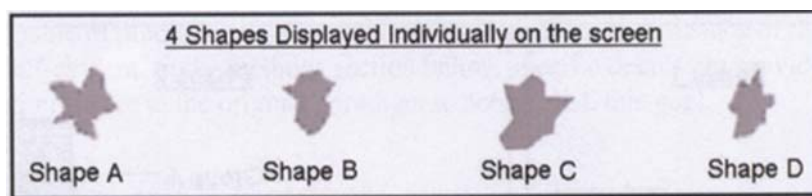
### **Subjects**

In total, 69 people (35 female; 34 male) with a mean age of 20.8 (ranging from 18 to 64, with a standard deviation of 8.3) completed the experiment. The number of participants chosen was based on a power analysis based on the effect size found in Franklin and Schooler’s (2011a, 2011b) experiments. This power analysis resulted in 64 participants. We ended up testing five more for reasons that had to do with the way subjects were selected in a school environment (so no optional stopping was used). The subject pool

consisted of some first-year psychology students participating for credit as a mandatory part of the curriculum at the University of Amsterdam, and, for the most part, students from a local high school in Alkmaar who were in their last year before entering university. This was because of the low availability of participants at the university.

### **Procedure and Materials**

The study was approved under number 2011-BC-2019 by the Faculty Ethics Review Board. After arriving at the test room, participants were asked to read an informational brochure informing them about the nature of the experiment. Before taking part in the experiment, each participant provided written consent.



**Figure 1. The four shapes used in the Go/NoGo tasks.**

They were then introduced to the tasks and the shapes that were used during the two Go/NoGo tasks (see the shapes in Figure 1), and informed that they were free to quit the experiment at any time. The experiment consisted of three phases.



**Figure 2. Flow chart of the experiment's several phases.**

In the first phase, preceding the two Go/NoGo tasks (phase 2 and phase 3), subjects performed an initial baseline reaction time task (see Figure 2). They were asked to respond to an "X" appearing center-screen on a computer at random intervals, ranging from 1,000 to 3,000 milliseconds during 20 trials, by pressing the "Enter" button on the keyboard. The mean baseline reaction time measured in this way for each participant was later used to "normalize" the experimental response times, thereby reducing the inherent inter-subject variability due purely to differences in physiologically driven motor responses.

After this, subjects were given the first Go/NoGo task (phase 2), with the instruction to simply do the best they could. The task was made up as follows (see Figure 2): Participants were, in each of the 64 trials, randomly shown one of four predetermined shapes on a computer screen at random inter-stimulus intervals uniformly distributed from 1,500 to 3,500 milliseconds. The screen size of the shape was 3.5 cm × 3.5 cm on a 30.8 cm × 23-cm computer screen with a resolution of 1024 × 768 pixels.

Participants were asked to press the Enter button if a Go shape appeared on the screen. In the first Go/NoGo task, there were two Go shapes. For instance, the participants were asked to respond when either shape A or shape B appeared on the screen, and to not respond to the two others (shapes C and D). Note that for each participant, the assignment of which shapes to respond to was random. This was important in order to avoid effects caused by intrinsic recognition of the shapes. After the first Go/NoGo task, they entered a second Go/NoGo task. In this task, participants had to respond to only one of the four shapes. The shape they had to respond to during the second Go/NoGo task was randomly chosen from the two they had to respond to during the first (i.e. in this example shape A *or* B).

The shape subjects had to respond to during *both* Go/NoGo tasks will be referred to as the “target-shape” for that specific participant. The shape to which the participants only had to respond to during the first Go/NoGo task, and therefore didn’t get further training on in the second Go/NoGo task, will be referred to as the “control-shape.”

The program used during the experiment was written with Visual Basic programming language using Real Studio 2011, version 4.3. It can be downloaded from: <https://www.dropbox.com/s/akv3k5p2ihwidlv/GNG.rb>

Finally, using the HIP-questionnaire (Human Information Processing) (Taggart & Valenzi 1990), subjects’ tendency toward rational or intuitive reasoning was assessed. This was done after the actual Go/NoGo tasks to avoid the effect of this questionnaire (and the resulting reflection on one’s thinking style) on subjects’ natural style and their resulting performance. Subjects were given statements concerning their thinking style. They rated how much the statement applies to them, from “always” to “never” on a 6-point Likert-scale. An example of such a statement is, “When solving problems I prefer to use proven methods over trusting my first intuitive impressions.”

### **Dependent Variables**

The dependent variables that we used in the analyses have been operationalized as follows.

### **"Normalized" Response Times**

From the data of the initial simple reaction time task, mean "baseline" reaction times were calculated for each subject. In addition, mean reaction times were calculated for each Go shape during the two Go/NoGo tasks per subject (two during the first task and one during the second task). We normalized these reaction times by dividing a participants' reaction time on a shape by their mean baseline reaction time measurement. In order to remove individual differences caused purely by differences in physiological motor responses, we divided the raw response times by the mean response time of each individual on the simple motor reaction (baseline) task. This, of course, is different from normalization by converting individual scores to z-scores. In the latter procedure, individual differences pertaining to the increased complexity of the Go/NoGo task compared with a simple task also are removed. We wanted to keep that particular aspect of the individual differences in our equations. Error rates were also calculated per task per subject. Averaged normalized response times were calculated using only the correct responses.

### **Intuition Score and Categorization**

For the HIP scores, the three scores related to a rational thinking style were added per subject. The same was done for the three scores related to an intuitive style, resulting in two scores for each subject: one signifying the amount of rational thinking ( $R$  = rational score), and one the amount of intuitive thinking ( $I$  = intuitive score). The intuitive scores were subsequently divided by the rational scores, resulting in a thinking style-score "IR," which varied between 1.5 and 0.7; the first indicating a very intuitive thinking style, the latter a very rational one. Subjects were categorized as "intuitive" if their IR was larger than the median, and as "rational" if their IR was smaller.

## **Results**

### **Subjects and Data**

The data of one subject had to be disregarded because the number of errors was so large that it was clear the subject hadn't understood the instructions. For one subject, there was data-loss caused by computer failure. The analyses, therefore, were performed for the remaining 67 subjects.

### **Hypothesis I: Retrocausal Training Effect**

To test our prediction that the second Go/NoGo task (phase 3) would have

TABLE 1

**Baseline Reaction Times in msec and Normalized Reaction Times on Target and Control Shapes for Rational and Intuitive Thinkers for the First Go/NoGo Task**

Group	Baseline (msec)			Target-shape			Control-shape			Diff (t)
	Mean RT	N	Std. Dev.	Mean Normalized	N	Std. Dev.	Mean Normalized	N	Std. Dev.	
Intuitive thinkers	354.46	35	31.98	1.73	35	0.23	1.80	35	0.25	3.4**
Rational thinkers	353.35	32	29.25	1.79	32	0.2	1.79	32	0.22	0.3 (ns)
<b>Totals</b>	<b>353.9</b>	<b>67</b>	<b>30.48</b>	<b>1.75</b>	<b>67</b>	<b>0.21</b>	<b>1.795</b>	<b>67</b>	<b>0.23</b>	<b>2.59*</b>

\* =  $p < 0.02$ , \*\* =  $p < 0.01$ .

a training effect on performance during the first Go/NoGo task (phase 2), the reaction times to both Go-shapes during the first Go/NoGo task (the target-shape and control-shape) were compared with each other to inspect whether the future Go/NoGo task in phase 3 had a retroactive practice effect on the first task. The normalized reaction times were always larger than one because the normalization factor was obtained in a simpler reaction time task in phase 1 of the experiment. A paired samples t-test was performed comparing the normalized reaction times of the control-shape and target-shape during the first Go/NoGo task. Reaction times to the target-shape proved significantly lower than reaction times to the control-shape ( $t = 2.59$ ,  $df = 66$ ,  $p = .012$  one-tailed, Cohen's effect size  $d = 0.22$ ), suggesting a retroactive practice effect of the second Go/NoGo task on the first (see Table 1). Data are available at: <https://www.dropbox.com/s/j44lvj0c561o5in/Main%20datafile.sav> (SPSS datafile).

### **Hypothesis II: Individual Differences**

To test whether this effect was more pronounced for subjects with an intuitive thinking style, we performed a one-way ANOVA with thinking style as a between-subject factor, comparing the difference in normalized reaction times between the target-shape and control-shape during the first Go/NoGo task for rational and intuitive thinkers. A main effect for thinking

style was found ( $F_{(1, 66)} = 4.477, p = 0.038$ ). We also repeated the paired samples t-tests comparing normalized response time for target-shape and control-shape for intuitive and rational thinkers separately. Only the intuitive group showed a significant difference in the expected direction ( $t = 3.41, df = 34, p = 0.001$ , one-tailed, Cohen's effect size  $d = 0.40$ ). When the same paired samples t-tests were performed using the raw reaction times (instead of the "normalized" responses), the same pattern emerged. Only the intuitive group showed a significant difference ( $t = 3.43, df = 34, p = 0.002$ ).

### **Exploration of the HIP**

The Human Information Processing questionnaire has 30 items, resulting in 6 subscales, called rat1, rat2, rat3, int1, int2, and int3. The authors of the HIP labeled these subscales "Logic," "Planning," and "Rituals" for rat1, rat2, and rat3, respectively, and "Insight," "Vision," and "Sensing" for int1, int2, and int3, respectively.

The formal test of our hypothesis (that intuitive subjects would show the anomalous training effect more than rational subjects) was tested using the compound measure  $IR = (int1 + int2 + int3)/(rat1 + rat2 + rat3)$ . The IR scores were normally distributed (Kolmogorov-Smirnov: 0.073,  $df = 67, p = 0.20$ ). The correlation between psi effect and global intuition score (IR) was a marginal  $R = 0.20$  ( $p < 0.052$ , one-tailed).

In this section, we explore which of the subscales that go into IR contributed most to this effect. First, we performed regular and partial correlational analyses using each subscale separately while controlling for all others to predict the performance of the subjects. The correlation data are given in Table 2.

The rat3 component "Rituals" correlates most strongly with the psi score ( $R = -0.36, N = 67, p = 0.002$ ). In spite of the label "rituals," the subjects scoring high on this attribute do not engage in spiritual traditions, but rather stick to rules and procedures. It could be argued that "rituals" here implies a lack of spontaneity and creativity. We prefer to label this scale "rigidity."

It can further be observed from Table 2 that some of the subscales show strong correlations among themselves. Therefore, we also calculated partial correlations where we controlled for all the remaining subscales. The partial correlation of psi score and "rigidity" happens to be near-identical to the regular correlation ( $R_{\text{partial}}(rat2, psi) = -0.37, N = 67, P = 0.003$ ). The other rational subscores also had a negative partial correlation with the psi scores, though not as strong as rat3. ( $R(rat1, psi) = -0.23; R(rat2, psi) = -0.16$ )



**TABLE 2**  
**Regular and Partial Correlations between Psi Performance and Subscales of the HIP,**  
**Controlled for All Other Subscales, and Regular Correlations**  
**between the Subscales Themselves**

	Psi score <sup>1</sup>		Rat1	Rat2	Rat3	Int1	Int2	Int3
	Regular	Partial	Regular	Regular	Regular	Regular	Regular	Regular
Rat1: Logic	-0.17	-0.23*	1					
Rat2: Planning	-0.02	-0.16	+0.37**	1				
Rat3: Rituals	-0.36**	-0.37**	+0.05	-0.33*	1			
Int1: Insight	-0.01	-0.02	-0.33**	-0.38**	-0.11	1		
Int2: Vision	-0.13	-0.20	-0.42**	-0.46**	+0.13	+0.47**	1	
Int3: Sensing	+0.12	+0.15	+0.1	+0.25	+0.06	-0.38**	-0.01	1

<sup>1</sup> Psi score = Normalized reaction time control-shape – normalized reaction time target-shape.

\*  $p < 0.05$ , \*\*  $p < 0.01$ .

From the partial correlations of the int-scales with psi performance, only int2 (vision) was marginally significant ( $R_{\text{partial}}(\text{int2}, \text{psi}) = -0.2$ ,  $p < 0.06$ ), but surprisingly this was in the negative direction. The int2 factor is labeled “vision,” and most items seem to measure some aspect of creativity. As we mentioned before, the rat3-subscale, which we re-labeled “rigidity,” can be interpreted as representing a lack of creativity. However, there is a minor positive correlation between rat3 and int2 ( $R(\text{int2}, \text{rat3}) = 0.13$ , n.s.). This is what we would expect for two subscales, both correlating in the same direction with psi performance. However, one subscale, rat3, measures “rigidity,” and the other, int2, measures “aspects of creativity.” One would expect these to have a negative correlation. It is unclear why both subscales that appear to measure opposing personality aspects both correlate in the same direction with psi performance. It should be remarked that neither of the int scales have a significant contribution to psi performance, so we shouldn’t take the apparent paradox too seriously. Basically, the only aspect that really counts is “lack of rigidity,” rather than the amount of intuitive processing, as it is measured by the int-subscales. This cautious conclusion fits with findings in the literature that psi performance correlates positively with the “openness factor” in the Neo Personality Inventory (Zingrone, Alvarado, & Dalton 1999). If we forget about the int subscales and use only

**TABLE 3**  
**Frequencies of the Different Shapes with Mean Normalized Response Times**

Go Shape	Mean Response Time as Target	Mean Response Time as Control	Mean Response Time	Frequency as Target	Frequency as Control
1	1,778	1,786	1,783	16	22
2	1,772	1,883	1,834	15	19
3	1,756	1,712	1,736	19	15
4	1,765	1,814	1,785	18	12
Total	1,767	1,802	1,785	68	68

the ratio scales, the correlation of psi performance with  $Rat = rat1 + rat2 + rat3$  is  $-0.32$ , ( $N = 67$ ,  $p = 0.004$  one-tailed).

#### **Alternative Explanations for the "Retrocausal" Effect**

As stated in the Introduction, in experiments of this kind, where a future condition is claimed to have a "retrocausal" influence on present behavior, it is mandatory to ensure these future conditions are properly randomized with replacement so that it is impossible to infer the future condition. For instance, in so-called presentiment research, the claim is that the actual physiological behavior of a participant is dependent on a future (randomly selected neutral or emotional) stimulus. However, in the current experiment, the relevant future condition (what shape will be the target-shape) is only determined once. Even if the randomization is weak, the participant isn't able to infer anything that could be used in the next trial.

However, the alternative explanation of conscious or non-conscious learning of the randomization is replaced in the current experiment by another potential explanation. Actually, this explanation occurs because the choice of target-shape from the possible four shapes is random and not counterbalanced. This may result in an over- or under-representation of a specific target-shape in the whole experiment. If and only if the participants have biases in response times for specific target-shapes (for instance, if it is intrinsically easier to respond to a specific shape, and that shape is over-represented as a target), we can expect that overall, participants will show

faster response times for the target-shapes. In Table 3, the mean response times for the different shapes are given in the relevant column.

To check whether the four shapes used in the Go/NoGo tasks were actually equally difficult to remember and respond to, a one-way ANOVA comparing the different shapes was performed with these normalized reaction times. There were no significant differences in response times for each of the four shapes (when the shape was the target,  $F_{3,66} = 0.28$ ,  $p = 0.99$ ), nor when the shapes were the controls ( $F_{3,66} = 1.512$ ,  $p = 0.22$ ).

Of greater importance for this potential alternative explanation is checking if the frequency distribution for the Go shapes significantly deviates from a random distribution. This does not appear to be the case: chi-square = 0.588,  $df = 3$ , n.s. for the target-shape frequency distribution, and chi-2 = 3.41,  $df = 3$ , n.s. for the distribution of control-shapes.

To assess whether the actual non-significant deviations from the perfect distribution could have produced an artificial differential response time effect between target-shapes and control-shapes, we ran a simulated t-test for each subject using the shapes that were actually used in his/her experiment, while using the subject's average response times for those shapes.

This simulation resulted in a small artificial effect; the mean normalized target-shape response time was 1.782 and the mean normalized control-shape response time was 1.785 ( $t = 1.07$ ,  $df = 66$ ,  $p = 0.22$ , one-tailed). The difference was only 0.005, while in the actual experiment, the differential effect was about 10 times larger. These results show that the artificial effect, due to deviations in the frequency distribution of shapes and their respective mean normalized response times, is able to explain only 0.15% of the total 2% effect. The fact that the difference in reaction times between the control- and target-shapes was only found for intuitive thinkers further renders this alternative explanation, based upon different difficulties and different frequencies, unlikely.

### Discussion

The prediction that the second Go/NoGo task (phase 3 of the experiment) would have a training effect on performance during the first Go/NoGo task (phase 2), and that this effect would be more pronounced for subjects with an intuitive thinking style, was supported by the results. During the first Go/NoGo task, intuitive subjects reacted significantly faster to the target-shape than to the control-shape. The only difference between the target- and control-shape was that the target-shape would be trained in the future (second Go/NoGo task), while the control-shape wouldn't. Rational subjects did not show this difference at all. This suggests that for subjects with an intuitive thinking style, the second Go/NoGo task had a retroactive practice effect

on their performance during the first Go/NoGo task. When this difference was compared for the entire subject pool, it was still significant, with an effect size  $d$  of 0.25, which is comparable to what Franklin & Schooler (2011a, 2011b) found in their experiments. Potential alternative (normal) explanations for this anomalous finding were excluded. However, given the impact that has been reported of Questionable Research Practices on psychological research findings, we will discuss this issue separately. The potential role of Questionable Research Practices has been simulated for the meta-analytic database of Ganzfeld-telepathy experiments, and from those simulations a conclusion was reached that these practices, if they indeed are used, might be able to account for at least a fraction of the anomalous results (Bierman & Bijl, in preparation).

### **Questionable Research Practices and Pre-Registration**

The current experiment was described in detail before starting the experiment. This proposal was submitted in part to the ethics committee to obtain permission and, in full, to an independent staff member who had the obligation to check if the final product (report and presentation) corresponded with the plan. This can be seen as equivalent to a formal pre-registration. Practically, it is intended to prevent post hoc selections without explicitly mentioning that such is an exploration. For instance, in the current experiment, we did not plan to do an analysis on the HIP-subscores, and this was reported in the section "explorations."

We asked an independent researcher, who is responsible for checking pre-registrations at the KPU-registry (<http://www.koestler-parapsychology.psy.ed.ac.uk/TrialRegistry.html>), to compare our research plan with the current intended publication as if it were a pre-registration, assuming we did adhere to the original plan. He pointed out that the original research plan did not explicitly state that the main hypothesis (retroactive training) was a confirmatory hypothesis. That could have given us a post hoc option to declare the study as exploratory, which would have given us the freedom to try out several different analyses of the main hypothesis. More importantly, the normalization procedure of reaction times was not specified. It is obvious that such an omission leaves the door open for various data transformations and adjustments, such as outlier corrections. The compound variable that determines the processing style of the participants from the sub-scores of the HIP was also not specified. He concluded that there still were too many ambiguities that offered degrees of freedom that could have been exploited post hoc. Although we didn't actually use this freedom, the current results should be taken in light of these shortcomings. The normalization procedure

we eventually used is logical in terms of having scores that are around 1. We therefore concluded that pre-registration is a good practice only when followed up by an independent comparison of the pre-registration with the final publication. Pre-registration with a public, openly accessible registry is already standard practice in medical and pharmaceutical research. It should be mentioned that in the 1980s the *European Journal of Parapsychology* required researchers to pre-register their experiments and the acceptance of a publication was solely dependent on the quality of the pre-registration, and not on the results. On the other hand, some of the more prolific researchers in parapsychology, and perhaps psychology in general, were for some time opposed to preregistration, claiming it would prevent “discovery.” All pre-registration does, however, is prevent post hoc exploration of data from being presented as planned analyses. As several authors on pre-registration stress, it is very important in this respect to make a clear distinction between exploratory and confirmatory research (KPU 2014, and forum discussions on OpenScienceFramework.com), and there is nothing against the exploration of data obtained in a pre-registered experiment.

### **Subscales of the HIP**

Looking at the exploratory results of the analysis of the HIP-questionnaire subscales, psi performance would appear to correlate negatively with rational thinking. The expected positive correlation with intuitive thinking could not be confirmed. These exploratory results seem to suggest that a too-rigid method of information processing hampers the psi effect significantly, while an intuitive method has a much smaller positive effect. Further research is needed to unravel the relation between intuition and psi performance. These rather confusing results with regard to HIP subscales should be considered in light of more recent work on thinking styles. The REI (Rational–Experiential Inventory) (Pacini & Epstein 1999), for instance, which in some sense attempts to measure the same rational-versus-intuitive processing styles differences, shows correlations with some of the Big Five factors. On one hand, the rational component correlates with “Openness.” “Openness” has been shown in other psi research to correlate with higher psi scores (Zingrone, Alvarado, & Dalton 1999). On the other hand, an experiential thinking style was correlated with the Big Five factor “Extraversion.” Extraversion has also been shown in psi research to correlate positively with psi performance (Eysenck 1967). With such complicated results, it appears that we must fundamentally rethink the relation between psi and personality. In light of the theoretical background of the current experiment, it would have been preferable to directly measure the brain-processes that could be seen as an operationalization of “coherence” in the

CIRTS model, rather than linking the yet ill-defined concept of “coherence” with an intuitive processing style, as measured by the HIP.

### Conclusion

The results of the present experiment are consistent with other experimental data suggesting the presence of anomalous correlations between present behavior and future random conditions. Interestingly, there is a growing attention in fundamental physics to “retro-causality,” often expressed in the form that the present is basically a “handshake” between present and future conditions (where the contribution of future conditions in most contexts are negligible) (Aharonov, Cohen, Grossman, & Elitzur 2013). Although rather rudimentary efforts have been published to integrate these findings in a psychological and physical model, it is clear that more breakthroughs in both physics and psychology are needed before we can begin to truly test and comprehend the workings behind these anomalous findings.

### Acknowledgements

We thank Jim Kennedy for comparing the original research plan with the final article in order to check for potential differences that could indicate Questionable Research Practices.

### Notes

<sup>1</sup> This study was a part of a master's thesis by the second author (see Bijl 2012), where the effect of speed-vs.-accuracy instructions on a Go/NoGo task performance for participants with a rational or intuitive thinking style were investigated.

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## RESEARCH ARTICLE

# An Investigation of Solar Features, Test Environment, and Gender Related to Consciousness-Correlated Deviations in a Random Physical System

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**Abstract**—Whereas a multitude of solar and geomagnetic variables were not correlated with significant deviations in continuous measurements from random physical systems (Random Event Generators), these variables were moderately correlated with REG output during periods of intention. The scalar components (2–10 nT) of the Interplanetary Magnetic Field ( $r = \sim 0.50$ ) and global geomagnetic activity ( $r = \sim 0.55$ ) were significantly correlated with REG deviations during the second minute of intention. Significance compared with unsuccessful deviations occurred during periods of intention when the Solar Radio Flux was about 20 units ( $2 \cdot 10^{-21} \text{ W} \cdot \text{m}^{-2} \text{ Hz}^{-1}$ ) higher. The polarity of the deviation was different within a Faraday (echoic) chamber than in a normal environment as well as between genders. The amount of energy associated with the increase in geomagnetic activity within the volume of human cerebrum is remarkably similar to the gravitational energy within this mass because of minute variations in  $G$  (the Gravitational Constant). These results indicate that a subset of variance shared across several components of the ambient heliogeophysical environment may be a significant mediator of intention-coupled changes in random variations in p-n junction devices, and those discrete energies associated with intrinsic variations in  $G$  may be relevant.

## Introduction

The integration of biological sciences and the study of space weather were largely initiated by the original and insightful work of the biophysicist

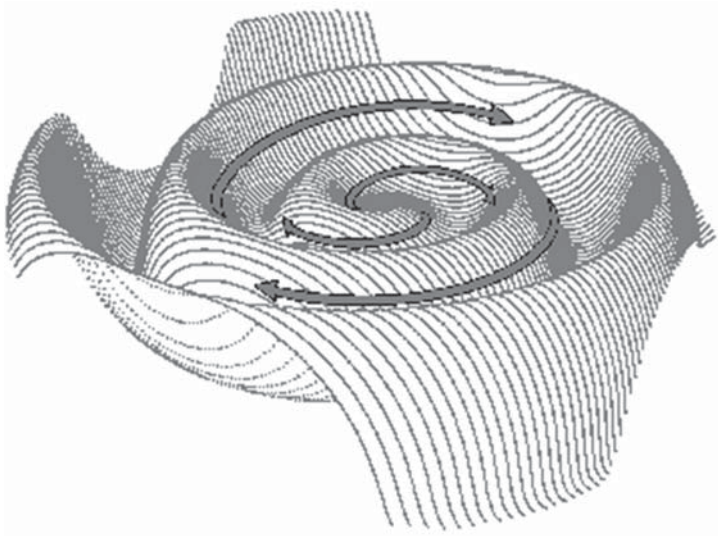


Alexander Chizhevsky, who examined relationships between these areas within the interdisciplinary framework of heliobiology. His investigations into the effects of solar activity on terrestrial systems were wide-ranging and included human health and epidemiology, psychological well-being, electrical systems, and the behavior of entire societies (Chizhevsky 1936). Many of these correlations were supported, rediscovered, or advanced through later research using both historiometry and laboratory experiments (e.g., Persinger 1999, Halberg, Cornelissen, Otsuka, Katinas, & Schwartzkopff 2001, Gumarova, Lissen, Hillman, & Halberg 2012). Solar activity has been shown to relate to both organic and other physical systems and has potential implications for the little-understood area of anomalous cognition and apparently nonlocal physical interactions involving human consciousness.

The sun, a main-sequence star at the center of our solar system, affects the entire heliosphere, including local planetary conditions on Earth. There are a number of specific measurements associated with various types of solar activity. One particular measure is the sunspot number. Sunspots are seemingly isolated regions of the sun created by powerful magnetic activity within the solar photosphere, observations of which have been recorded since before the Common Era (Schöve 1955). One reason for examining this phenomenon in the context of solar radiation is that many coronal mass ejections (CMEs) originate from areas surrounding sunspots (e.g., Hundhausen, Sawyer, House, Illing, & Wagner 1984).

One measure of sunspots is the Wolf number ( $R$ ). This is a daily value used to denote the number of sunspots observed in a given day, and has been in use since 1848 (Clette et al. 2007). The formula used to obtain  $R$  is  $k(10g + s)$ , where  $k$  = the personal reduction coefficient,  $g$  = number of sunspot groups, and  $s$  = number of sunspots (Herrman 2012). Another measure associated with overall solar activity is the solar radio flux. This refers to radio emissions often produced when plasma within highly active regions of the sun becomes trapped beneath magnetic fields (Donnelly, Heath, Lean, & Rottman 1983), and as such are also related to sunspots. Significant correlations have been observed between daily values for these measures of solar activity ( $r_s = \sim 0.6$  to  $0.7$ ).

These emissions are measured at about 2,800 MHz at the 10.7-cm wavelength (Tapping 1987). The background x-ray flux is a similar measure often used, which is also related to the occurrence of solar flares (e.g., Neupert 1968, Sheeley, Howard, Koomen, & Michels 1983). Emissions in the x-ray wavelength are measured as background flux within the ionosphere (e.g., Thomson, Rodger, & Dowden 2004). This variable is typically denoted in coefficients of flux ( $\text{W}\cdot\text{m}^{-2}$ ) ranging from low background ( $<10^{-8}$ ) to extreme flares ( $>10^{-3}$ ) (Thompson 2013).



**Figure 1. Representation of a “Parker spiral.”** Image source: NASA Cosmicopia ([helios.gsfc.nasa.gov/solarmag.html](http://helios.gsfc.nasa.gov/solarmag.html))

Aside from measures directly associated with overall solar activity, there are also a number of solar wind features that are often examined in the context of space weather. The heliosphere itself is a direct product of the solar winds that pervade the solar system (Holzer 1989). This phenomenon is actually a result of particle streams released from the sun’s atmosphere, and largely consists of charged electrons and protons (McComas et al. 1998). Solar proton events, or proton storms, refer to large numbers of these particles being released from the sun, and are usually associated with solar flares or CMEs (Kahler, Hildner, & Van Hollebeke 1978). These particles can enter the local magnetosphere and release their energy within the ionosphere through the process of ionization (Shea & Smart 1990).

The phenomenon of solar wind is also responsible for the interplanetary magnetic field (IMF). This refers to the magnetic field of the sun, which has been distributed among the planets of the heliosphere (Levine, Altschuler, & Harvey 1977). Because solar winds are a plasma, they have sufficient electrical conductivity—produced by a magnetohydrodynamic effect with both electric and magnetic components—to carry magnetic field lines from the sun throughout the solar system (e.g., Pogorelov, Zank, & Ogino 2004). However, as the solar magnetic field extends into interplanetary space, the sun continues to rotate on its axis, while the forces of plasma and magnetic pressure oppose one another. As a consequence of these two factors, the

IMF forms a “Parker spiral” and produces local variations throughout the heliosphere (Figure 1; Thomas & Smith 1980). This field affects not only the outer planets, but also the magnetic field of our own planet (e.g., Friis-Christensen et al. 1972).

The phenomenon of significant deviations in random systems associated with cognitive “intention” has been noted in a number of experiments. Apparently nonlocal interactions between human “intention” and non-deterministic external systems have been observed in many laboratories (e.g., Jahn, Dunne, Nelson, Dobyms, & Bradish 1997, Radin & Nelson 2003). Previous research also suggests that neurophysiological effects may mediate this apparent phenomenon of consciousness-correlated collapse (3C) or presumably random motions. This term, 3C, is preferred to traditional and now pejorative terms concerning “mind–matter” relationships. For example, electroencephalograph (EEG) activity in the alpha and beta frequencies has been shown to widen during control measures compared with periods when participants successfully achieved significant deviations in a random event generator (REG) device (Giroldini 1991). Furthermore, a relationship has been identified between the effects of cognitive “intention” and cerebral biophoton emission (Dotta & Persinger 2011, Caswell, Dotta, & Persinger 2014a) and both gravitational and electromagnetic mediated effects on the cerebral volume (Caswell, Collins, Vares, Juden-Kelly, & Persinger 2013).

Given that solar activity has been implicated as a potential factor that may affect human physiology (e.g., Cherry 2002), it was hypothesized that more subtle effects of the environment on statistically significant deviations in a random physical system correlated with consciousness may be found with factors external to the immediate geosphere. If variations of solar activity exert an influence on neurophysiological functioning, and cerebral effects are involved in the process of the 3C phenomenon, then relationships between this form of nonlocal interaction and solar variable measures should be observed. Furthermore, it was hypothesized that some form of seasonal variation in successful REG operation associated with the position of the Earth relative to the sun would be revealed.

The obvious variable of participant gender has been previously examined in the context of 3C phenomena, specifically with apparent nonlocal human–machine interactions. However, results are relatively conflicting depending on the study. This ranges from overall performance gender differences (Gissurarson 1992), differences between genders within specific modes of target data analysis (Dunne 1998), and no apparent gender differences (Nelson, Jahn, Dobyms, & Dunne 2000). Because of this disparity, it was hypothesized that there might be an environmental covariate that may mediate any 3C performance differences between males and females.



**Figure 2. Random event generator (REG); A Psyleron REG-1 device used throughout the following experiments.**

## Methods

### **Subjects**

Participant age ranged from 22 to 52 years for  $N = 26$  ( $N = 13$  females,  $N = 13$  males). All were recruited from the Laurentian University campus or the immediate community.

### **Data and Equipment**

Daily average values were obtained from the Goddard Space Flight Center (GSFC)/Space Physics Data Facility (SPDF) OMNIWeb interface ([omniweb.gsfc.nasa.gov](http://omniweb.gsfc.nasa.gov)) for the scalar component of the interplanetary magnetic field (IMF; nT) and proton density of solar winds ( $N \cdot \text{cm}^{-3}$ ). Daily sunspot number (R; Wolf numbers), average daily background x-ray flux (peak flux in coefficients of  $10^{-6} \text{ W} \cdot \text{m}^{-2}$ ), and average daily solar radio flux (SFU;  $1 = 10^{-22} \text{ W} \cdot \text{m}^{-2} \cdot \text{Hz}^{-1}$ ) were obtained from the National Oceanic and Atmospheric Administration (NOAA)/National Geophysical Data Center (NGDC) database ([www.ngdc.noaa.gov](http://www.ngdc.noaa.gov)). Values for the equation of time (apparent solar time) were calculated using the Local Sidereal

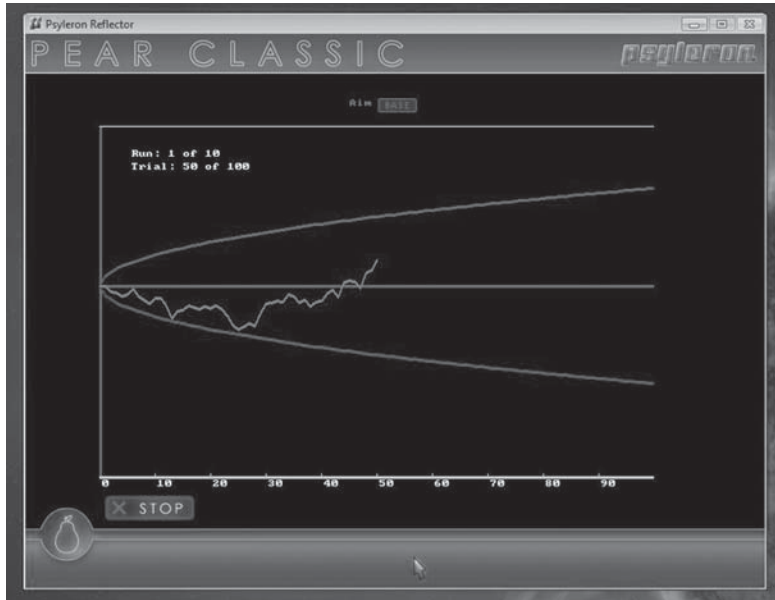
Time Clock maintained by Jürgen Giesen ([www.jgiesen.de/astro/astroJS/siderealClock/](http://www.jgiesen.de/astro/astroJS/siderealClock/)). Finally, cosmic ray data (average impulses/min/day) was obtained from the Moscow Neutron Monitor ([cr0.izmiran.rssi.ru/mosc/main.htm](http://cr0.izmiran.rssi.ru/mosc/main.htm)).

Random data was produced using a Psyleron REG-1 random event generator (Figure 2; [www.psyleron.com](http://www.psyleron.com)). The device produced a random output that was generated by electron tunneling effects within two field effect transistors. The varying voltage levels that result from this process were converted into digital data through a gated sampling procedure, which allowed for regularly spaced bit sequences. The output of both transistors was internally compared through an alternating (0, 1) XOR masking process in order to reduce the potential influence of physical artifacts or other external environmental variables. The device itself was further protected from static electromagnetic factors by an aluminum outer shielding and a Permalloy mu-metal inner shield.

The device was rigorously calibrated prior to shipment to ensure that the output conformed to statistical expectations. The random event generator (REG) was also tested in control experiments within our laboratory to confirm these expectations. The resulting data were collected through a USB port using Psyleron FieldREG and Reflector software packages on a laptop computer. Data were produced at a rate of either 1 or 2 events (200 0,1 bits/event) per second (experiment-dependent), with each event referring to the number of 1's out of 200 bits with binary probabilities, represented by a value of 0 to 200. The theoretical (chance) mean for each event is 100, with a standard deviation of  $\sqrt{50}$ . Pilot testing and the following experiment indicated no significant differences between event rates ( $p > .05$ ). Measures of entropy (HX) were obtained using Matlab 2011a software. All other statistical procedures were conducted using SPSS software v.17.

### **Procedure**

In each experiment, participants were seated in a dark, comfortable environment approximately 1 m from the REG device and asked to intend for the data output to deviate either up or down (positive or negative). The device was placed on the right side of each individual. For  $N = 8$  participants, the test location was an ordinary room, where the REG was placed at shoulder height. For the other  $N = 18$ , the test location was an acoustic chamber that was also a Faraday cage. The background average resultant fields within the cage near the REG was about 20,000 nT, compared with a typical average of 47,000 nT outside of the chamber. The REG was placed at ground level approximately  $45^\circ$  from the plane of the forward line of sight. Prior to testing, participants viewed a short demonstration with

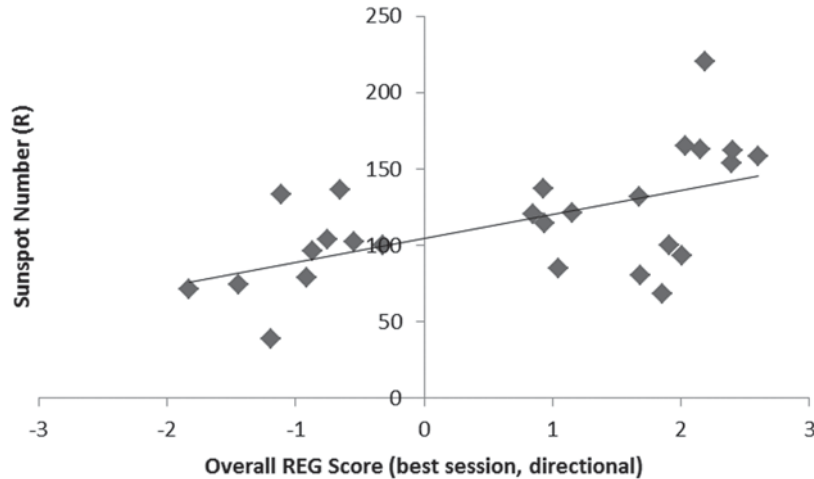


**Figure 3. Sample of Reflector software collecting data from REG device; jagged center line is the moving cumulative deviation.**

the REG software (e.g., Figure 3) in order to understand what they would be focusing their intention on. No feedback was provided during testing. REG data collection was kept hidden from the experimenter until analysis. No significant differences were identified between varying bit rates, and averages were computed accordingly. All environmental measures were obtained following testing.

### **Data Analyses**

Random Event Generator (REG) data were obtained from  $N = 26$  participants within two separate experiments. Individual event scores were standardized according to .5 chance expectations ( $[x - 100] / \sqrt{50}$ ). One experiment contributed  $N = 15$  sessions, each lasting approximately 5 minutes. The second experiment consisted of  $N = 11$  participants, with data collection lasting about 8 minutes. Minute averages, absolute means, and standard deviations were computed. To maintain sample consistency for statistical analysis, the first 5 minutes of testing from each participant were used for minute averages. Overall session scores were computed using Stouffer's



**Figure 4. Correlation between sunspot number and participants' best REG score.**

method ( $\sum z / \sqrt{n}$ ), where  $z$  = individual event z-scores and  $n$  = the number of events. Various planetary and solar variables were entered into the database. Significant ( $p < .05$ ) correlations of  $r \geq .5$  were reported.

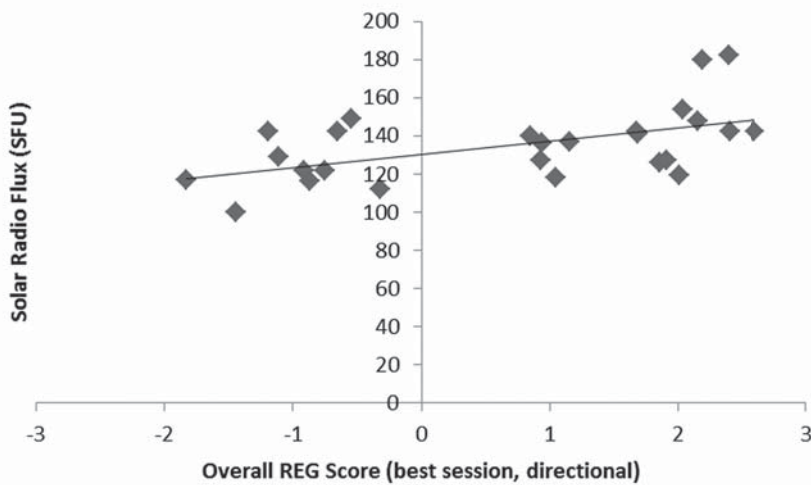
## Results

### ***REG Output without Intention***

Daily averaged REG output was gathered for a period of two months. All space weather variables of interest were entered into the database and examined for potential correlations. Subsequent analyses revealed no apparent relationships between the output of a random event generator (REG) and various measures of space weather ( $p > .05$ ). It is therefore hypothesized that any potential correlations revealed could potentially be attributed to relationships between space weather and biological/physical processes involved in the consciousness-correlated collapse (3C) of an external random process.

### ***Solar Activity and REG Operation***

Pearson and Spearman correlations revealed a statistically significant relationship between the best overall REG session score from each participant (e.g., greatest overall deviation obtained), taking direction into



**Figure 5. Correlation between solar radio flux and participants' best REG score.**

account (e.g., positive value = deviation in intended direction), and both sunspot number (Figure 4;  $r = .57, p = .002; rho = .601, p = .001$ ) and solar radio flux (Figure 5;  $r = .541, p = .004; rho = .558, p = .003$ ). Subsequent partial correlations showed that both solar variables related to REG score independently. Their correlations vanished ( $p > .05$ ) when controlling for the effects of the other. This suggests they shared the same source of variance with respect to the REG data.

Given the directional REG measures employed in the previous correlations (e.g., accounting for direction of intention), it appears that overall solar activity may be associated with a greater tendency for deviations correlated with operator intention. To further pursue this hypothesis, participants were split into groups determined by whether or not they had successfully achieved at least one significant REG score at the  $p \leq .025$  level ( $z \leq 1.96$ , one-tailed;  $N = 8$  successful,  $N = 18$  non-successful). Independent  $t$ -tests revealed a significant difference in both sunspot number (Figure 6;  $t_{(24)} = 3.865, p = .001, r = .619$ ) and average solar radio flux (Figure 7;  $t_{(24)} = 2.924, p = .007, r = .513$ ) on the day of testing between successful and nonsuccessful operators (Table 1). A significant difference was also found for the average background x-ray flux (Figure 8;  $t_{(24)} = 2.885, p = .008, r = .507$ ).



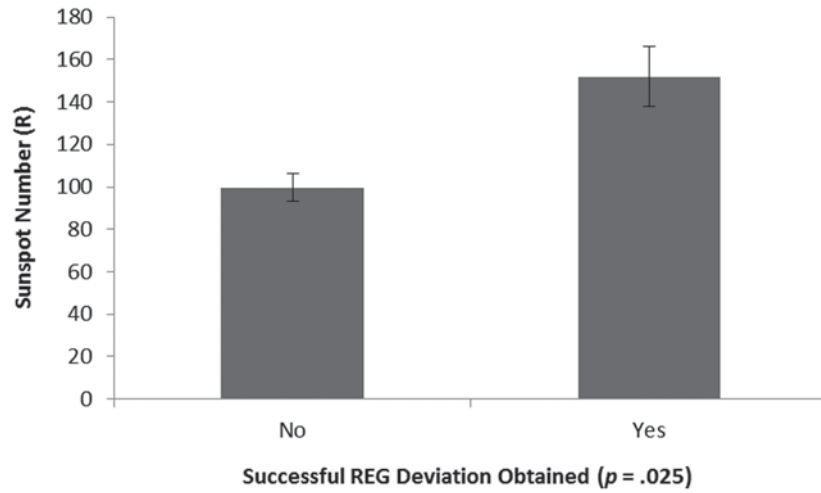


Figure 6. Difference in daily sunspot number between successful and non-successful REG operators; vertical bars represent standard error of the mean (SEM).

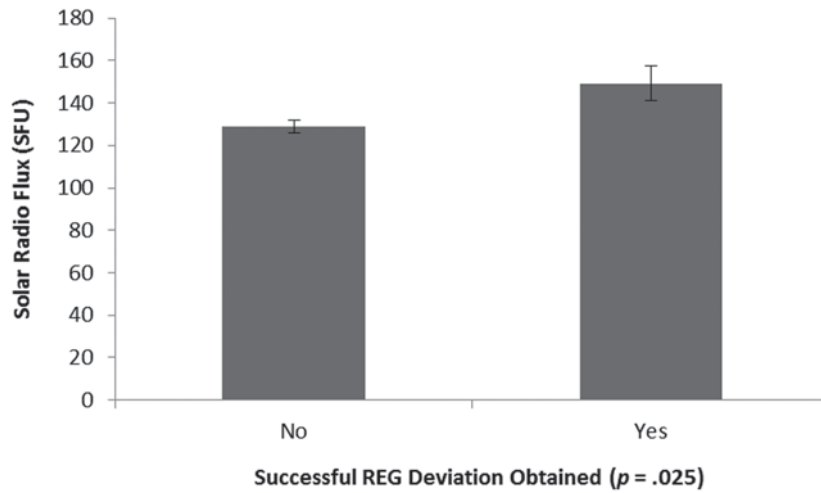


Figure 7. Difference in daily solar radio flux between successful and non-successful REG operators; vertical bars represent SEM.

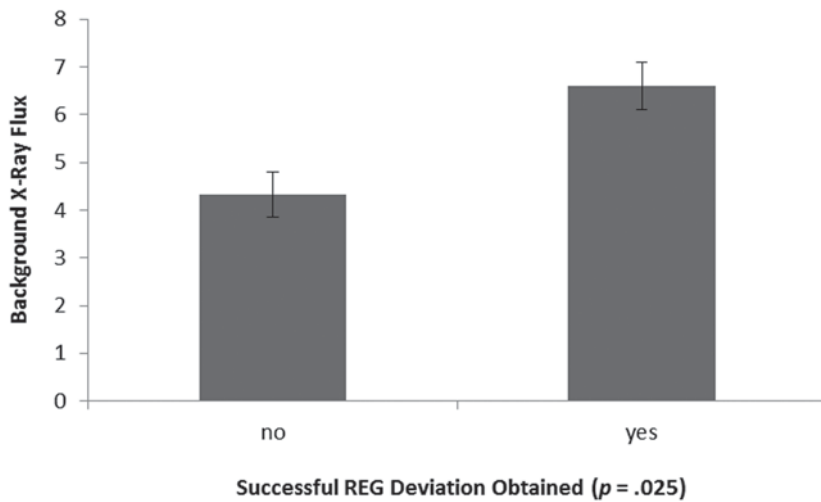


Figure 8. Difference in average daily background x-ray flux between successful and non-successful REG operators; vertical bars represent SEM.

TABLE 1  
Mean ( $\mu$ ) and Standard Deviation (sd) Values of Sunspot Numbers, Solar Radio Flux, and Solar X-Ray Flux for Each Operator Group

REG Score	Sunspot # - $\mu$ (sd)	Radio flux - $\mu$ (sd)	X-ray flux - $\mu$ (sd)
Significant	151.88 (40.07)	149.25 (22.54)	6.60 (1.41)
Non-significant	99.50 (27.84)	128.78 (13.19)	4.32 (2.01)

**Interplanetary Magnetic Field Correlations**

Minute-to-minute averages and standard deviations were examined for potential correlations with measures of space weather, employing both parametric and nonparametric testing. A statistically significant relationship was found between average REG scores during minute 2 of testing and the scalar component of the IMF (Figure 9;  $r = .51, p = .008; rho = .483, p = .013$ ). This relationship was slightly increased when controlling for the variance associated with cosmic ray impulses ( $r = .526, p = .007; rho = .513, p = .007$ ). Average REG score (minute 2) and scalar IMF measures were

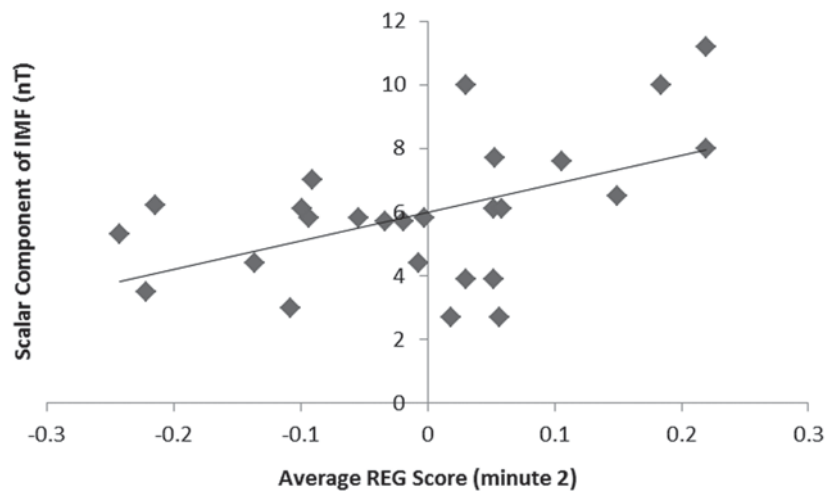


Figure 9. Correlation between the scalar IMF component and average REG score during minute 2.

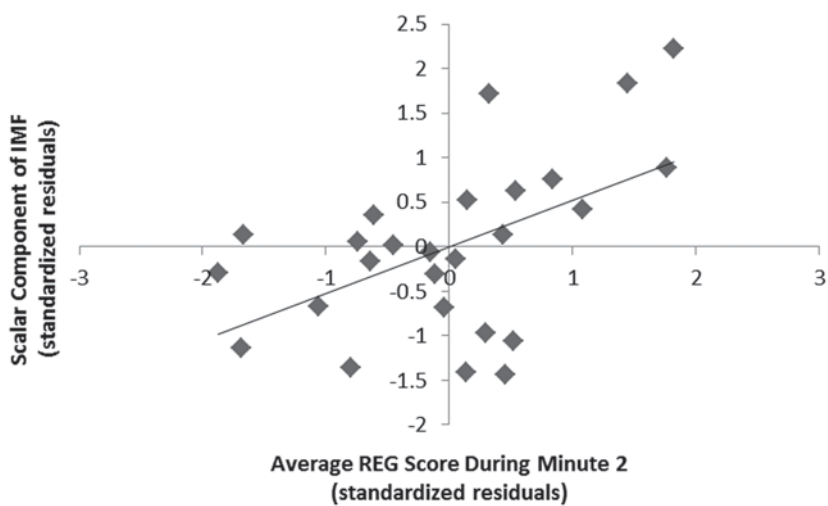
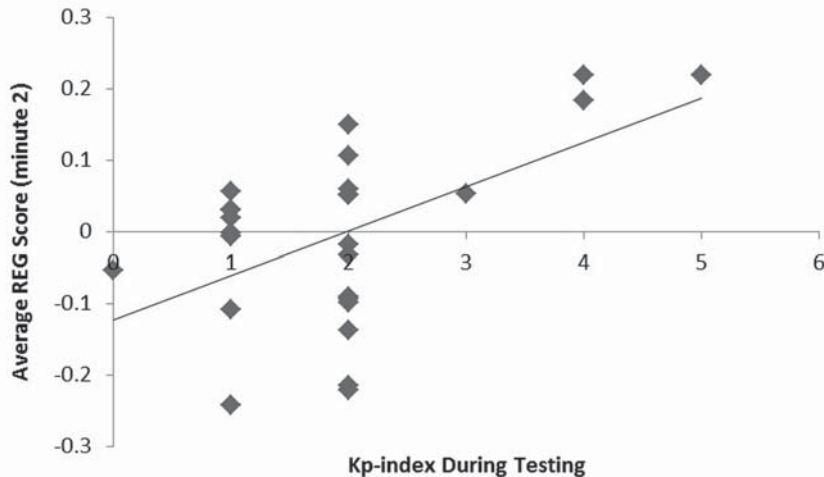


Figure 10. Partial correlation between the scalar IMF component and average REG score during minute 2, controlling for effects of cosmic ray impulses.

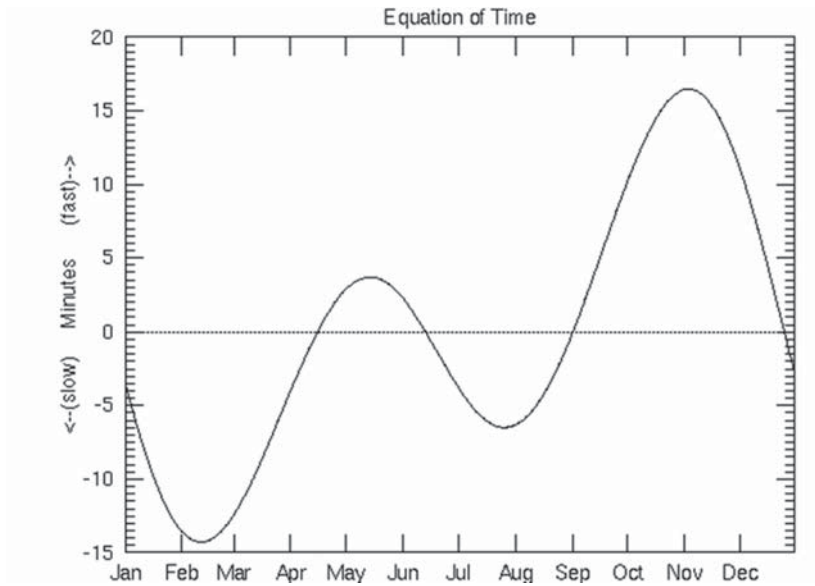


**Figure 11. Averaged deviation from random (vertical axis) during the second minute of testing and the global geomagnetic index during that period.**

each entered into separate linear regressions with daily averages of cosmic ray impulses as the independent variable. The subsequent standardized residuals were obtained. The partial correlation is shown in Figure 10. We previously found that this temporal component (2 minutes) appears to be particularly critical with regard to apparent human–REG interaction (Caswell, Collins, Vares, Juden-Kelly, & Persinger 2013, Caswell, Dotta, & Persinger 2014a).

### **Ambient Geomagnetic Conditions**

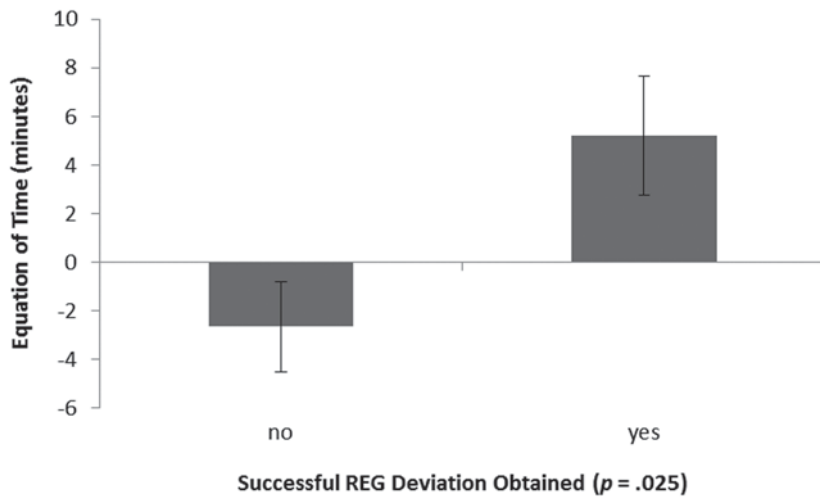
The systematic correlations of similar magnitudes between REG scores and numbers of sunspots, solar flux unit output, and interplanetary magnetic field strengths indicated the association with a locality would require some representation of these changes in the vicinity of the measurements. The most obvious local representation would be global geomagnetic activity. Consequently, the daily  $A_p$  indices as well as the three-hour  $K_p$  values for the interval of the experiment and each of the three-hour increments before and after the increment were obtained from the Solen online database ([www.solen.info/solar/](http://www.solen.info/solar/)). There was a significant correlation ( $r = 0.54, p < .01$ ;  $\rho = 0.41, p < .05$ ) between the global geomagnetic activity at the time of the intention experiments and the REG deviations. These results are shown in Figure 11.



**Figure 12. Equation of time; difference between mean solar time and apparent solar time throughout the year.** Image source: Nick Strobel ([www.astronomynotes.com/nakedeye/s9.htm](http://www.astronomynotes.com/nakedeye/s9.htm))

### ***Isolating Shared Sources of Variance***

To discern the potential sources of shared variance, a factor analysis was completed for the magnitude of the REG variation during the second minute, sunspot numbers for the day, IMF values for the day, solar flux units for the day, and the  $K_p$  indices (ambient, but global geomagnetic activity) for the interval in which the measurements were obtained. To accommodate the small sample size, loading coefficients of  $>0.70$  were considered significant. The first factor (eigenvalue = 2.38), which accommodated almost half of the variance, was loaded significantly by the  $K_p$  values (0.85), IMF (0.85), and the REG variation during the second minute (0.83). The second factor (eigenvalue = 1.53), which explained 31% of the variance, was loaded significantly by numbers of daily sunspots and solar flux units. Together the two factors accommodated 78% of the variance. These results indicate that the proximal geophysical (interplanetary magnetic field and geomagnetic field variations) variables share a source of variance with the REG variations.



**Figure 13. Difference in equation of time (minutes) between successful and nonsuccessful REG operators; vertical bars represent SEM.**

### **Time and REG Performance**

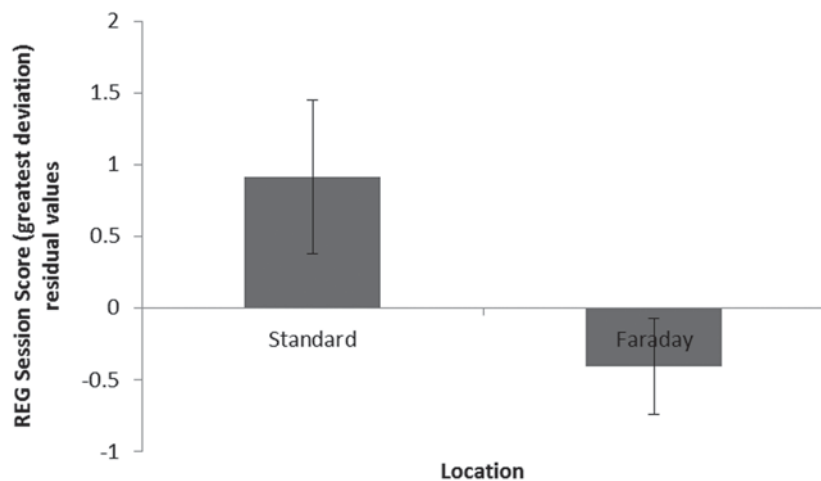
Although standard time measures noon with regard to the position of the sun relative to the local meridian, the actual time of this crossing varies throughout the year. The equation of time represents the difference between mean solar time and apparent solar time. The difference between these two times varies by up to 16 minutes in either direction (Figure 12). Values for the equation of time (in minutes) were obtained from an online Sidereal Time calculator for each test session (Table 2). Values for the equation of time can be approximated using  $(GAST - \alpha) - (UT + \text{Offset})$ , where GAST = Greenwich apparent sidereal time,  $\alpha$  = right ascension of apparent Sun, and UT = Universal Time. Independent t-test analysis determined that there was a significant difference in the values associated with the equation of time and the occurrence of REG session scores of  $p \leq .025$  (Figure 13;  $t_{(24)} = 2.429$ ,  $p = .023$ ,  $r = .444$ ). This may suggest some form of seasonal variation associated with the occurrence of various “psi” processes, which may also provide an explanation for why some experiments have been unsuccessful in the past.

**TABLE 2**  
**Mean ( $\mu$ ) and Standard Deviation (sd) Values for the Equation of Time Values (in Minutes) between REG Operator Groups**

Equ (min)	Significant	Non-Significant
$\mu$	5.219	-2.648
Sd	(6.909)	(7.897)

**Test Location and REG Outcome**

Finally, N = 8 participants completed testing within a normal room, while N = 18 were tested within an acoustic chamber that was also a Faraday cage. Initially, there were no indications of significantly different REG session scores between locations. However, when entered into an analysis of covariance (ANCOVA), a significant difference was found for the best session score (e.g., greatest deviation obtained) between locations when covarying for the solar wind proton density ( $F_{(1, 25)} = 4.808, p = .039, \eta^2 = .162$ ). A linear regression was run for REG scores with proton



**Figure 14.** Difference in best REG session score obtained between locations, covarying for solar wind proton density; vertical bars represent SEM.

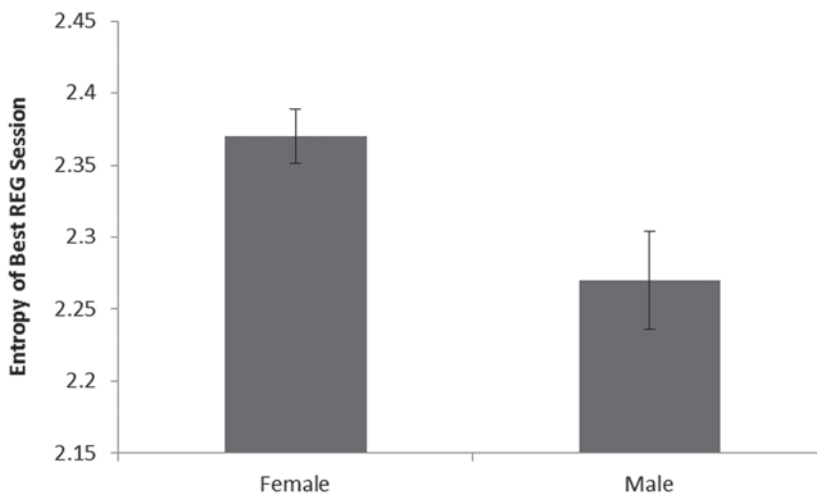
**TABLE 3**  
**Mean ( $\mu$ ) and Standard Deviation (sd) Values of**  
**REG Session Entropy (HX) for Male and Female Participants**

HX (REG)	Female	Male
$\mu$	2.37	2.27
Sd	(.068)	(.121)

density as the independent variable to obtain standardized residuals for demonstrating this significant difference in Figure 14. More specifically, more positive deviations occurred within the standard location ( $\mu = .578$ ,  $sd = .955$ ), while more negative deviations were obtained within the Faraday cage ( $\mu = -.257$ ,  $sd = .9$ ).

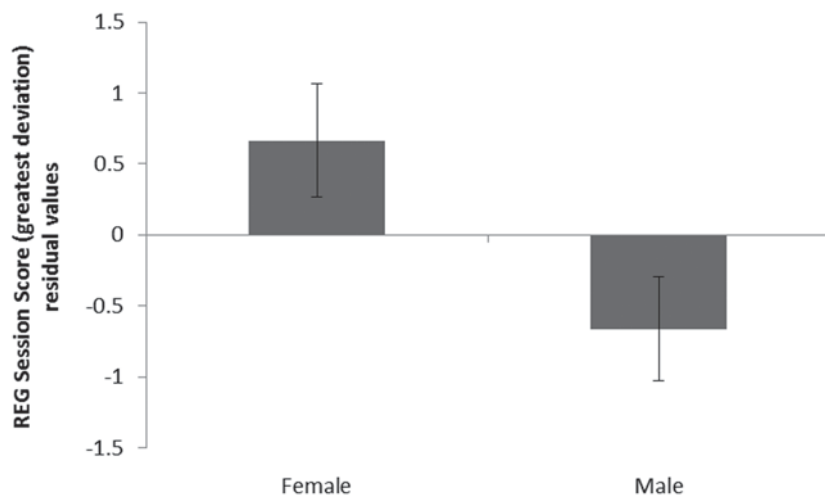
#### **Gender, REG Performance, and Complexity**

Signal complexity of the REG event data for each session was obtained using the entropy function in Matlab software. The measure of entropy computed by this method is similar to the Shannon entropy of a random variable (e.g., Shannon 1948),  $H(X) = -\sum_x P(x)\log_2 P(x)$ , where  $x$  = the random variable,



**Figure 15. Entropy (HX) values of REG data (greatest deviation) for males and females.**





**Figure 16. Difference in overall REG score (best session for each participant) between genders, controlling for the effects of lunar apogee/perigee; vertical bars represent SEM.**

$X$  = the number of possible values within  $x$ , and  $P$  = the probability mass function. Entropy values (HX) represent the level of uncertainty within the data, where higher values indicate greater complexity and less predictability. Signals with greater complexity possess a greater number of distinct values, and these values are more evenly distributed. Using an independent t-test, it was determined that HX values of each participant's best REG session (greatest deviation) were significantly greater for females than males (Figure 15 and Table 3;  $t_{(24)} = 2.523$ ,  $p = .019$ ,  $r = .454$ ).

Given the relationship between the reproductive cycle with associated hormonal changes and the lunar cycle (e.g., Cutler, Schleidt, Friedmann, Preti, & Stine 1987), it was hypothesized that if there were further differences between genders with regard to REG operation, the relative position of the moon may be a factor. Subsequently, an ANCOVA was used to compare REG deviations between males and females while covarying for the effects of both lunar apogee and perigee. Distance from the moon was measured by the number of days since the most recent lunar apogee and perigee for each session, as derived from the Lunar Extremes database. The greatest REG session score obtained by each participant (e.g., largest overall deviations) differed significantly between genders, with the greatest effect found when simultaneously controlling for both apogee and perigee (Figure 16;  $F_{(1,25)} = 5.802$ ,  $p = .025$ ,  $\eta^2 = .186$ ). More specifically, females obtained significantly

more positive ( $\mu = .42$ ,  $sd = .912$ ) scores, while male operators resulted in more negative scores ( $\mu = -.42$ ,  $sd = .232$ ).

### Discussion

We measured moderately strong correlations between solar and geomagnetic variables and the deviation from chance from electronic outputs from random event generators when people were intending to alter these outputs. On the other hand, there were no significant correlations between these variables and the output of the REG when there were no subjects in proximity. These results suggest that an interaction between solar–geomagnetic variables, some physical aspect of human cognition (intent), and random variations from electron tunnelling through p-n junctions at a distance of approximately 1 m may have occurred. We cannot exclude the possibility that simply the mass or presence of the person produced these effects. However, in other experiments (Caswell, Vares, Juden-Kelly, & Persinger 2014b) involving the exposure of subjects to experimentally produced magnetic fields, intention with the presentation of those fields was required to affect the significant deviations. Periods of no-intention, even with the field present, produced changes that did not differ significantly from the no-intention, no-field condition.

Although the solar and geomagnetic variables we employed in this study are strongly intercorrelated, the energy values associated with the most specific proximity values could be revealing. The mean solar flux units (sfu) during successful REG deviations was about 140 in comparison with deviations that did not differ from chance (120). Because  $1 \text{ sfu} = 10^{-22} \text{ W}\cdot\text{m}^{-2} \text{ Hz}^{-1}$ , this means that at the level of the typical width of a p-n junction (with an average p and n width of about  $0.5 \cdot 10^{-6} \text{ m}$ ) and the lower end of the width of a synapse ( $0.5 \cdot 10^{-6} \text{ m}$ ), the energy at one unit time at 140 sfu (when there was significant deviation) would be  $3.5 \cdot 10^{-33} \text{ J}$ , while the energy at one unit time around 120 sfu would be  $3.0 \cdot 10^{-33} \text{ J}$ . The difference of 20 sfu between the two is equivalent to  $5 \cdot 10^{-34} \text{ J}$ . When divided by Planck's constant ( $6.626 \cdot 10^{-34} \text{ J}\cdot\text{s}$ ), this difference is the equivalent shift (increase) of frequency of about 0.5 to 1 Hz. This frequency is within the range of both dc–ac interfaces in cerebral activity as well as hydromagnetic (hm) waves produced by interactions between the geomagnetic magnetic field and variations in the interfacing interplanetary magnetic field.

If we assumed that the entire cerebrum was involved, with approximately  $\sim 6 \cdot 10^{13}$  synapses, the total additional energy output from the  $3.0 \cdot 10^{-33} \text{ J}$  would be  $\sim 3 \cdot 10^{-20} \text{ J}$  per second. Although more likely to be incidental than real, if the total energy available of this magnitude were integrated per second, the possibility that the state of the entire cerebrum might be

shifted by a single neuron affected by these forces becomes feasible. There is experimental evidence that the activity of a single neuron can shift the state of an entire rat's cerebral cortices (Cheng-Yu, Poo, & Dan 2009). In addition, a single neuron's state is the initiating condition for a more grossly expressed behavior, such as the display or lack of display of an operant response (Houweling & Brecht 2007), which involves millions of neurons.

The role of gravitational phenomena in REG-related deviations has often been neglected because of the assumption of low energies and minimal forces for local space and matter. However, recently Persinger and St-Pierre (2014) showed that the "random variation" in  $G$  ( $6.67 \cdot 10^{-11} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$ ), which is about  $10^{-14} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$ , was moderately and negatively correlated with the strength of the interplanetary magnetic field within the range of  $\pm 8 \text{ nT}$ . The gravitational energy from this variation within a mass of 1 L of water (the approximate proportion of water within the volume of the human brain) would be  $\sim 3 \cdot 10^{-14} \text{ J}$ . On the other hand, the energy from 8 nT within the volume of 1 L of water would be  $3 \cdot 10^{-14} \text{ J}$ . The mass-energy equivalence for this quantum of energy is the same order of magnitude as the electron ( $10^{-31} \text{ kg}$ ).

Although these correlations would be consistent with a nonlocality explanation for the deviations from random exhibited by the REG, the potential local effects cannot be ignored. The correlation between REG scores and geomagnetic activity within which the subject and the equipment would have been immersed was 0.54. This would suggest that the other correlations with solar and IMF variables were significant because they were correlated with the changes in the local geomagnetic field. This inference was supported by the exploratory factor analysis (considering the small sample size) that indicated more than 70% of the variance for the REG deviations during the second minute, global geomagnetic activity at the time of the measurement, and interplanetary magnetic field variations shared a common source. On the other hand, the direct solar measurements (sunspot number and solar flux units) shared variance on a separate factor.

The actual geomagnetic intensity during the experiments was between 0 and 5. This is equivalent to variations of 0 to 2 nT and 48 to 56 nT. The greatest deviations (Figure 11) during intention occurred when the geomagnetic activity was above  $\sim 20 \text{ nT}$ . This would have been a substantial difference in the magnetic energy stored within the cerebral volume. According to traditional formulae, the value would be  $2.4 \cdot 10^{-13} \text{ J}$  during the greatest deviations and  $2 \cdot 10^{-15} \text{ J}$  during the smallest deviations. Assuming each action potential is associated with  $2 \cdot 10^{-20} \text{ J}$ , the induced energy during the magnetic field oscillations would be equivalent to the discharge of  $10^7$  neurons. This is within the order of magnitude of the neurons associated

with specific cognitions as inferred by fMRI studies. Assuming an average of 58 neurons per cubic mm, this number of total neurons (if cluster in proximity rather than distributed) could involve a volume of  $1.2 \cdot 10^{-4} \text{ m}^3$ , or less than 10% of the total volume.

Because the significant correlation between geomagnetic variation and REG occurred during the second minute (60 to 120 s) of this measurement, the mean power (assuming an average of 90 s or 0.01 Hz) would have been  $2.4 \cdot 10^{-15} \text{ W}$ . Given the typical cross-sectional area of  $10^{-2} \text{ m}^2$ , this would be equivalent to about  $2.4 \cdot 10^{-13} \text{ W} \cdot \text{m}^{-2}$ . Interestingly, this value is within the range of background cosmic ray power density at the earth's surface. Cosmic (proton) ray background has been considered one source of "random variation." If the volume containing the number of estimated neurons ( $10^7$ ) is considered, the volume of brain mass would extend a length of about 5 cm. With this cross-sectional area ( $2.5 \cdot 10^{-3} \text{ m}^2$ ), the power density would be on the order of  $10^{-11} \text{ W} \cdot \text{m}^{-2}$  to  $10^{-10} \text{ W} \cdot \text{m}^{-2}$ . This power density is within the range of that associated with photon emission from the cerebrum during cognition (Saroka et al. 2013).

From a traditional heliogeophysical perspective, the ultimate source of the variation that produced the shifts in REG output while the person was intending originated from the sun. The results of the factor analysis indicate that the solar (distal) variables were less related than the proximal (interaction between the interplanetary magnetic field and global geomagnetic field) variables. However, there would be a physical coupling between the two sources. We suggest that a subset of energies originating from the sun and mediated through the interplanetary magnetic field (which is the sun's magnetic field) to the geomagnetic volume within which the person is immersed contributed to the REG changes. Because intention was required, one interpretation is that some component of solar-originating energies interacted with the processes associated with neurocognition.

The difference in polarity between the REG, that is positive or negative deviation, as a function of the location in which the subjects were tested may help reveal the potential source of the negative or positive drift in these studies. The "normal" room, within which positive deviations occurred, was measured after the experiment by a magnetometer that displayed these parameters: resultant field: 46,770 nT, inclination: 70.6 deg. On the other hand, these values within the Faraday cage (acoustic chamber) were 19,822 nT and 53.8 deg, respectively. The latter value is within the range of magnitude of that found along the equator where the imaginary shift in polarity between North Pole and South Pole flux lines would occur. However, because we did not test the REG in multiple sites that displayed similar intensities outside of the acoustic chamber, we cannot conclude if

the direction of the REG deviation was caused by the unique location or the magnetic field discrepancy.

None of the solar–geomagnetic variables were associated with the entropy of the REG scores. The only category that displayed a statistically significant difference involved gender. This is particularly interesting when compared with differences in statistical complexity for female–male EEG measures. Ahmadi et al. (2013) examined the complexity of EEG profiles using fractal dimensions. Although this method differs from entropy, when the mean values of all EEG channels were averaged together within each gender, the ratio of female–male complexity (as determined by fractal dimension) was strikingly similar to that obtained for REG entropy measures of female–male complexity (1.02 and 1.04, respectively). The presence of male–female differences in complexity may help explain an interesting historical pattern involved with spontaneous cases of “poltergeists.” The ratio of females to males ranges between 2:1 and 20:1, depending upon the study. If the gender differences in electroencephalography and complexity are applicable, then the role of space–time geometry and the information within the matter affected by the proximity of these individuals could be investigated.

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## RESEARCH ARTICLE

### Children with Life-between-Life Memories

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**Abstract**—Studies of children claiming to have past-life memories have revealed that some of these children also claim to remember the “bardo,” or life-between-life state. Although there seems to be a small number of those with past-life memories, the number increases if we also consider children without past life memories (cf. Sharma & Tucker 2004, Tucker 2005:183–184). This article will report on some cases of Japanese children who claim to have life-between-life memories and show that the presence of life-between-life memories does not depend upon the presence of past-life memories. This suggests that children with past-life memories must be viewed within a larger context of the large group of children with one or a combination of the four types of memories: “in the womb,” birth, life-between-life, and past-life.

#### Introduction

A six-year-old boy recalls his experience before he was born, saying, “I was flying in the sky, looking for my mother. Looking down. I could see my mother and chose her. I thought she was the best person. She looked lonely, and I thought, ‘If I come to her, she will not feel lonely anymore.’” A nine-year old girl describes the place where she was before she came to her mother: “There were many children, or souls, and a god, an entity with authority.” To our question “Is he like a school teacher?” she replied: “No, no, no! He is much more generous,” and said, “He was looking after us, like a counselor.” There are many children in Japan who claim to remember such life-between-life experiences.<sup>1</sup>

The phenomenon itself is not new. One of the earliest examples is the case of Katsugoro, a Japanese boy born in 1806, who gave detailed memories of his past-lives. He was taken to a house in a different village where he



claimed to have lived, and was eventually accepted by his previous parents as their son Tozo reborn. He talked about his life-between-life memories, saying that after his death, he was guided to a beautiful field by a man with long white hair, and after spending some time there, he was led by that man to his present house and reborn.<sup>2</sup> Ian Stevenson reports many examples of children with life-between-life memories,<sup>3</sup> and Sharma and Tucker (2004) focus on the analysis of such memories.

The notable characteristic of the cases discussed here is that in contrast to the cases investigated by Ian Stevenson and his colleagues, most of the children claiming to remember life-between-life memories did not have past-life memories. The existence of children with life-between-life memories and no past-life memories is not unexpected if the survival of consciousness and reincarnation are real. Works by Ian Stevenson and Jim Tucker with Poonam Sharma have shown that a portion of children with past-life memories also have life-between-life memories (Stevenson 1975, 1983, Tucker 2005, Sharma & Tucker 2004), which means that many of the subjects with past-life memories do not have life-between-life memories. This suggests the existence of reverse cases, i.e. cases of children with life-between-life memories without past-life memories.

In this article, we will discuss the phenomenological properties of these cases and suggest an analytic framework that incorporates not only past-life and life-between-life memories, but also “in the womb” and birth memories.

### ***Survey of Children’s “In the Womb” and Birth Memories***

The existence of children with life-between-life memories came to our attention through a survey conducted by one of the authors (Ikegawa, an obstetrician and gynecologist). Inspired by studies undertaken by David Chamberlain, Thomas Verny, and others (Chamberlain 1988, 1998, Verny & Kelly 1981, Verny & Weintraub 2002), who reported cases of children claiming to have “in the womb” or birth memories, Ikegawa conducted a questionnaire-based survey in 2003 (Ikegawa 2005). The questionnaire, which was distributed to 3,601 parents through nursery schools and kindergartens in two cities in Central Japan, contained questions about whether their children have ever reported “in the womb” or birth memories, either spontaneously or in response to questioning. The number of questionnaires answered was 1,620, giving a response rate of 45.0%. The results of the survey concerning the two types of memories is shown in Table 1.

These figures show that if we include children who were specifically asked about such memories, a fairly large number of children talk about “in the womb” memories (30.5%) and birth memories (19.3%).<sup>4</sup>

**TABLE 1**  
**Children with "In the Womb" and Birth Memories**

	Spontaneous Statements /1620	Statements after Questioning /1620	Combined Statements /1620
"In the Womb" Memory	38 (7.1%) 2.3%	496 (92.9%) 30.5%	534 (100%) 33.0%
Birth Memory	22 (6.6%) 1.4%	313 (93.4%) 19.3%	335 (100%) 20.7%

Although there were no questions about life-between-life and past-life memories in the questionnaire, some of the parents reported that their children talked about these memories as well. This is how the existence of Japanese children with life-between-life and past-life memories came to our attention.

### **The Subjects**

In the present study, we investigated a total of 21 children with life-between-life memories. Some of the subjects are from those whose parents responded to the questionnaire-based survey described above. Others are those whose parents contacted us directly or were introduced to us by early childhood educators. The breakdown is as shown in Table 2.

**TABLE 2**  
**The Subjects**

	Male	Female	Total
Questionnaire and Interview	5	8	13
Questionnaire	5	3	8
Total	10	11	21

The mean age of the subjects at the time of the investigation was 88 months (range 50 months to 177 months) old (the median age was 98 months old). It was 91 months for those with interviews and 83 months for those without interviews. We handed a questionnaire to parents who agreed

**TABLE 3****Questions Concerning Life-Between-Life Memories in the Questionnaire**

- 
- 
- |    |  |
|----|--|
| 1  | The age when the child started talking about life-between-life memories  |
| 2  | If there is any time or occasion when the child talks about the memories   |
| 3  | If there is any change in the child's state when he/she talks about the memories   |
| 4  | The reaction of the parents to the memories  |
| 5  | How the child describes the place where he/she was in the life-between-life state  |
| 6  | Whether there was a person or an entity there, and if there was, the role that person or entity plays there  |
| 7  | The feeling the child had when he/she was in the life-between-life state   |
| 8  | Whether the child was able to see people and events on the earth   |
| 9  | Whether the child says he/she chose their parents, and if the answer is positive and he/she chose both the mother and father, which he/she chose first |
| 10 | Whether there is a reason why the child was born, and if the answer is positive, what the reason is  |
| 11 | How and when the child came to his/her mother's tummy  |
| 12 | Whether the child made any statement that matches an event before he/she was born  |
- 

to participate in the study. In 13 cases, parents judged that their children would talk to us about their memories, so we also conducted interviews with these children. In one of the 13 cases, the interview was conducted via Skype.

The questionnaire consists of three sections. The first section contains questions about the child's background, including the child's handedness, the ages when the child first uttered a word and a two-word sentence, the family's religion, the parents' educational background, and the presence or absence of complications during the pregnancy.

The second section contains questions concerning life-between-life memories, which are listed in Table 3.

Section 3 contains questions about "in-the-womb" memories, birth memories, and past-life memories. We asked the parents if the child had these memories and if he/she did, to describe what the child said about these memories.

Of the parents, only mothers replied to the questionnaire.

### **Results**

The mean age when the children started talking about life-between-life memories was 45.2 months (range 21 to 70 months) old (the median age is 48 months old).<sup>5</sup> Of the 17 parents who answered Question 2 in Table 2, 14

**TABLE 4**  
**Number of Children Talking about Memories of Each Stage**

Stage I	Stage II	Stage III
2	21	12

state that their children talk (or talked) about the memories during relaxed times such as bedtime or while taking a bath.<sup>6</sup> The remaining three parents did not notice such a tendency. Of the 15 parents who answered Question 3, 10 noticed some changes such as the child becoming eloquent, speaking very clearly, and speaking with concentration. One parent reported that her child, who was stuttering, became fluent only when he talked about life-between-life memories. Of the 15 parents who answered Question 4, 14 stated that they were interested in their children's stories. One parent stated that she was initially disturbed and that it took her some time to realize that talking about life-between-life memories did not necessarily mean the child had mental problems. Thirteen of the 15 parents who answered Question 4 gave information about their spouses' (the children's fathers') attitude toward the memories: Two showed some interest but the remaining 11 were indifferent.

In analyzing the answers to Questions 5–12, it is convenient to adopt the framework proposed by Sharma and Tucker (2004). In order to analyze life-between-life memories of Burmese children, they proposed a framework that divides life-between-life memories into three stages: The first stage (Stage I) is a transitional one illustrated by memories of seeing their body or funeral, being taken away from weeping relatives, being directed to a different place, etc.; The second stage (Stage II) is characterized by marked stability and illustrated by memories of staying in a particular place, being involved in various activities, etc.; The final stage (Stage III) includes memories of choosing parents, being directed to them, etc. Questions 5–8 in Table 3 are concerned with Stage II, and questions 9–11 with Stage III, respectively. The number of children in the present study relating memories of each stage is shown in Table 4.

Four of the 21 children investigated in this study claimed to have past-life memories. The figure in the first column of Table 4 corresponds to two of these four children. One described the funeral of the previous personality, and the other talked about seeing the burned house in which the previous personality and her mother died.

Let us now consider the children's Stage II and Stage III memories in detail.

Thirteen of the 21 children described the place as "cloud or sky," and three of them as "light." The remaining five described the place variously as "a wide space where you can see the Earth," "a place like a star," "a place where there are a number of levels," "up there," and "a place in the shape of a long ellipse."<sup>7</sup>

All 21 children said they were not alone in the life-between-life state. 14 claimed there was a god or god-like entity. They also said that the entity was like a counselor, making suggestions about their future parents or giving permission to be born to the parents they chose. Twelve claimed that they were with their current family members (mostly brothers or sisters) and/or friends. One child said that there were many "light balls" present, but that it was difficult to say who they were, although he believes some of them were somebody close to him in current life.

Thirteen children described how they felt in the life-between-life state. Eight of them said they felt "peaceful" or "calm," and two said "joyful" or "excited." The remaining three said "difficult to describe," "not different from what I feel now," and "lonely."<sup>8</sup>

Fifteen said they were able to see "earthly affairs" from the place they were in the life-between-life state, but their memories were limited, relating only to their parents and households.

Seventeen children said that they chose their parents. Nine of them said that they chose only their mothers. Eight of them said that they chose their fathers as well as their mothers. Of the eight, four said that they chose their fathers and mothers simultaneously,<sup>9</sup> and the remaining four said they chose their mothers first.

Thirteen children said they remembered why they decided to be born. The reasons were: to meet or help their mothers (3); to help other people (5); to become happier than they were in their previous lives (2); and to enjoy life (3). One child said he did not remember why he was born because he forgot the reason when he was born in order to find what it is in the current life.

Twelve children said they remembered when they came to their mother's womb. Three of them said somebody (a god, a shining ball, or an angel-like entity) helped them to come to their mother.

Three of the 21 children gave statements that matched their parents' memories before they were born.

One of them, a female child, who was five or six at the time, said to her mother, "When you were young, I frequently came to you." This statement matches her mother's experiences before she got married: She often felt that



**Figure 1. A picture by a child of the house where the child's mother used to live.**

a small child (or a child-like entity) was looking at her and bustling around her.

The second child, who started talking about her life-between-life memories at the age of five, said to her mother: "I saw you in a gorgeous white dress. You were holding a dog." The mother had indeed held a dog while wearing her wedding dress. After the wedding ceremony, she had entered a room where the dog was awaiting her return. She clearly remembered this experience because holding a dog in a wedding dress is not something you are supposed to do.<sup>10</sup>

The third child, who was six years old at the time, drew a picture of a four-story building surrounded by mountains (Figure 1) and said, "This is where you lived. I saw you there." Her mother was astounded because,

as a child, she lived in a four-story building from which she could see the surrounding mountains.

Lending credibility to the stories told by the children investigated in the present study is the story of James Leininger, an extremely strong American case of the reincarnation type, who made statements similar to those made by these Japanese children. When his father, Bruce, picked up four-year-old James and told him how happy he was to have him as a son, James said, "That's why I picked you: I knew you would be a good daddy." Perplexed, Bruce said, "What did you say?" James replied, "When I found you and Mommy, I knew you would be good to me." Bruce then asked, "Where did you find us?" James replied, "Hawaii. It was not when we all went to Hawaii. It was just Mommy and you. I found you at the big pink hotel." Bruce and his wife had indeed stayed at a pink hotel in Hawaii before their son James was born (Leininger & Leininger with Gross 2009, pp. 153–154).<sup>11</sup>

The nature of the evidence for possible survival of consciousness presented here is admittedly weak, and one might argue that life-between-life memories of children without past-life memories have little evidential value and the investigation should be limited to children with past-life memories. We should point out, however, that there do not seem to be notable differences between the life-between-life memories of the four subjects with past-life memories and those of the remaining 17 subjects without such memories. We should also point out the possibility that further investigation might reveal the existence of cases with stronger evidence.

### **Comparison with Burmese Cases**

Sharma and Tucker (2004) present some detailed analyses of the life-between-life memories reported by Burmese subjects in connection with the three stages described above. There is an interesting difference between the Burmese subjects and the Japanese subjects with respect to Stage II memories, which are characterized by marked stability. At the time of the investigation, Sharma and Tucker found 19 cases in which Burmese subjects describe the place where they stayed in the life-between-life state. Nine said that they stayed in a tree, four in a pagoda, and two remained near the place of death. In contrast, in our study, the places the Japanese children said they stayed at in the life-between-life state were in the "sky or cloud" (13), in the "light" (3), and in other various areas (5).

This difference might be caused by differences in religious backgrounds. In the Burmese cases, the religion was Buddhism combined with native animism. They believed that death initiates a new birth into one of 30 other

nonhuman realms, and that during the period in which a person lives as a discarnate entity, he or she may be assigned some task such as that of guarding temples or treasures (Stevenson 1983:209–210). In the Japanese cases, however, only three parents said their religion was Buddhism. One said Christian, and the remaining 17 said “no religion.”<sup>12</sup> So, though it is significant that there are common features in the life-between-life state in the Burmese and Japanese cases, there is an important difference that seems to reflect the cultural differences between the two nations.<sup>13</sup>

#### **Four Types of Memories**

The present study has shown that there are many children who claim to have life-between-life memories but no past-life memories. If the life-between-life memories reported by children with past-life memories were completely different from the life-between-life memories reported by children with no past-life memories, these two might need to be treated separately. However, because there are common features shared by the life-between-life memories reported by the two groups, we believe that we are justified in studying all life-between-life memories as one group.

Sharma and Tucker (2004:102) report that at the time of their writing, 217 (19.6%) out of 1,107 cases entered into a computerized database at the University of Virginia Division of Perceptual Studies included life-between-life memories. We suspect that the actual figure (corresponding to “B” in Figure 2) might be higher because at least two factors could have contributed to an underreporting of the presence of life-between-life memories among children with past-life memories. First, researchers (Ian Stevenson and his colleagues) have not always asked for information about whether the subjects claim to have life-between-life memories because their main concern has been verifiable aspects of children’s past-life memories. Second, many cases were investigated after the subjects stopped talking about past-life memories, so the data inevitably rely on witnesses’ statements. It would be reasonable to assume that there are at least some cases in which the subject would have talked about life-between-life memories had they been asked if they had such memories when they were still young.

From the perspective of survival research, “in the womb” and birth memories will be of no value, but the inclusion of these memories in the investigation gives us a wider perspective in analyzing cases of the reincarnation type and cases of children with life-between-life memories. Consider Table 5, which shows all possible combinations of the presence or absence of the four types of memories: “in the womb;” birth, life-between-life, and past-life memories.



**TABLE 5**  
**Four Types of Memories and 16 Possible Combinations**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
"In the womb" Memories	+	+	+	+	-	+	+	-	+	-	-	+	-	-	-	-
Birth Memories	+	+	+	-	-	+	-	-	-	+	+	-	+	-	-	+
Life-between-life Memories	+	+	-	-	-	-	-	+	+	-	+	+	-	+	-	+
Past-life Memories	+	-	-	-	-	+	+	+	-	+	-	+	-	-	+	+

The symbols "+" and "-" indicate the presence and absence of the memories, respectively. Within the four types of memories, commonality decreases in descending order (in the leftmost column of Table 5). Depending on whether a child has one or more of the four types of memories, there are 16 patterns.

Data collected to date and reported above suggest that the recollection frequency of pre-life memory classes declines in the following sequence:

Birth memories > womb memories > inter-life memories > past-life memories

We can presume that this empirical finding reflects a combination of conditions that jointly cause it to be the case that birth memories are easier to recall than womb memories, womb memories are easier to recall than inter-life memories, etc. For the present we cannot be precise about what these conditions are, but we can speculate that they might involve factors such as experience remoteness, duration, emotional intensity, etc. However, on the assessment that these resultant frequencies correlate to "difficulty to recall," it would be natural to suppose that if a child can remember a "more difficult to recall" class, they would be likely to recall all the memory classes that are "less difficult to recall" as well. Given this reasoning, the first five patterns given in Table 5 are the naturally expected ones, while the later patterns would be unexpected.

In the present study, 16 of the 21 children said they had "in the womb" memories and 15 of them said they had birth memories. Based on the classification in Table 5, the present subjects are analyzed in Table 6.

Because the children under the present investigation all have life-between-life memories, possible types occurring in the present data are

**TABLE 6**  
**Classification of Subjects by Presence or Absence**  
**of the Four Types of Memories**

Pattern (1–16 of Table 1)	Pattern 1	Pattern 2	Pattern 4	Pattern 9	Pattern 11	Pattern 12	Pattern 14
Number of occurrences	3	10	1	2	3	1	1

Pattern 1, Pattern 2, Pattern 8, Pattern 9, Pattern 11, Pattern 12, Pattern 14, and Pattern 16. As expected, Pattern 2, one of the natural patterns, is the highest in occurrence. Pattern 1, another of the natural patterns, is the second highest in occurrence, although it is equaled by Pattern 11. Therefore, the occurrence of the types seems to be in conformity with the conjecture that the first five patterns in Table 5 are natural ones that are expected to occur with the highest frequencies.

**Conclusion**

This study has shown that the presence of life-between-life memories does not depend on the presence of past-life memories. Thus, children with past-life memories must be viewed within the context that there is a larger group of children with one or various combinations of the four types of memories (“in the womb” memories, birth memories, life-between-life memories, and past-life memories), and that children with past-life memories and those with life-between-life memories are subgroups of this larger group. Based on theoretical considerations and the admittedly small number of examples, we have suggested that combinations of the four types of memories can be divided into natural patterns and irregular patterns. We hope that future investigation, with larger samples will demonstrate the validity of this conjectural analysis.

**Notes**

<sup>1</sup> In the case of children without past-life memories, the term “life-between-life memories” may be regarded as inappropriate because it implies the existence of past-life memories. However, because one of our goals is to point out the common characteristics between children with past-life memories and those without them, we will keep using the term without any implication that it presupposes the existence of past-life

memories. Note that we cannot avoid this problem by using other terms such as “intermission memories” or “bardo” because they have the same implication.

- <sup>2</sup> The original report was written in Japanese by Hirata Atsutane in 1823. An English translation, which Ian Stevenson cites in his 1960 essay, was published by Lafcadio Hearn in 1897.
- <sup>3</sup> For example, the cases of Puti Patra and Veer Singh (Stevenson 1975), the cases of Disna Samarasinghe and Lalitha Abeyawardena (Stevenson 1977), and the case of Nasir Toksöz (Stevenson 1980). Numerous other examples are given by Stevenson (1983, 1997a, 1997b).
- <sup>4</sup> From these figures, we cannot know how many children were asked and said nothing.
- <sup>5</sup> These figures are based on 17 responses. Note that they should be taken with some reservation because most parents do not remember the exact age when their children started talking about life-between-life memories, therefore they answer “about two years old” or “probably three years old.” In such cases we ignored the “about” or “probably” and counted them as “two years old,” or “three years old.”
- <sup>6</sup> In Japan, young children usually bathe with their parents and the family bathtub is often an important place for parent–child communication.
- <sup>7</sup> This child might be describing “in the womb” memories. However, because he talked about other Stage II memories, we classified this statement as an example of life-between-life memories.
- <sup>8</sup> It is difficult to understand this claim because he also said he was with his cousin.
- <sup>9</sup> One child said she chose her father first because she saw him slightly earlier than her mother. We interpreted this statement as “simultaneous.”
- <sup>10</sup> There is a photograph of this event. Her mother emphasizes that the child had never seen the picture before the statement.
- <sup>11</sup> Jim Tucker pointed out that the stories told by two of the three Japanese children are different from those told by other children of the reincarnation type (CORT) because the events described by them took place a long time before conception. This raises the question about when children choose their parents (if they actually do so as they claim), which will not be explored here.
- <sup>12</sup> According to a survey conducted by Gallup in 2006–2008, Japan is ranked the 8th least religious country among 143 countries, with 25% of people answering “yes” to the question, “Is religion an important part of your daily life?” (Crabtree & Pelham 2009).
- <sup>13</sup> Sharma and Tucker (2004) point out the existence of culturally connected features in both near-death experiences and life-between-life memories. See

Kellehear (2009) for similarities and differences observed in near-death experiences reported from various countries.

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ESSAY

## **Shamans of Scientism: Conjuring Certainty Where There Is None**

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**Abstract**—Some vociferous proponents of established science assert that it should always be believed when there are controversies over issues of public importance. That assertion rests on three assumptions, none of which are usually made explicit: 1) that only science is capable of arriving at truths about the natural world and that it actually does so; 2) that “science” is identical to the views propounded by the contemporary prevailing establishment of science, its mainstream institutions; and 3) that science can be distinguished unequivocally, with certainty, from everything else. None of those presumptions has been demonstrated to be correct, and indeed there are excellent historical and logical reasons to regard all of them as wrong. Since these underlying assumptions cannot be proven, self-styled “skeptics” and other activists who seek hegemony for contemporaneous scientific consensus engage in intellectual and rhetorical misdirection to give actual uncertainty the appearance of “practical” certainty. In doing so, activists fail to acknowledge the crucial distinction between a point of view that appropriately guides scholarly discourse or scientific research and views (expert opinions or assertions or conclusions) that “everyone” should accept and that offer appropriate guidance to public policies and actions.

### **Introduction**

Mainstream science typically resists unorthodox claims, even when they turn out later to have presaged a revolutionary advance (Barber 1961). In an increasing range of fields, mainstream science has become increasingly dogmatic (Bauer 2012a). Challenges to established views are resisted by those seeking to discredit them as mistaken, wrong. When the stakes are particularly high, the seemingly objective and technical pejorative “pseudoscience” is being superseded by the emotionally more evocative “junk science” and “denialism” (Bauer 2013).

Relatively minor deviations from orthodoxy are resisted via the normal routines of science: Methods and theoretical approaches are subjected to critical scrutiny, the soundness of the evidence is questioned, and the unorthodox conclusions drawn are then said to be shown to be incompetently arrived at and wrong.

Radical challenges to mainstream views, however, like those of interest to the Society for Scientific Exploration and the *Journal of Scientific Exploration*, typically encounter a different mode of resistance: Instead of confronting the presented evidence and its provenance, such challenges are dismissed as pseudo-science, at times because they are declared to belong to a whole intellectual territory that has already been pronounced pseudo-science (Gardner 1957), say psychic phenomena, homeopathy, or cryptozoology (Loxton & Prothero 2013).

Such a shortcut that avoids grappling with the specifics of methods and data relies on unstated assumptions: that only science is capable of arriving at correct descriptions of the real world, that one can definitively recognize something to be science as opposed to not-science or pseudo-science, and that contemporary institutions of science and their members or representatives can speak with authority about what science is and knows.

The belief that only science is capable of arriving at truths about the natural world, generally described as scientism, has not gained general acceptance in the intellectual world. Similarly, the belief that science can be definitively distinguished from not-science or from pseudo-science is not generally accepted in the intellectual world. Further, equating “science,” which enjoys enormous public prestige and status, with the contemporary consensus flies in the face of the historical fact that science has progressed by modifying or superseding successive sets of mainstream consensus, demonstrating that they had *not* been sound knowledge (Barber 1961, Kuhn 1970).

The philosophy of science has a long record of discussing the so-called “demarcation problem” of distinguishing proper science from not-science, but there has not emerged anything like general approval of any principles or a set of criteria by which science could be indubitably recognized as such, and by means of which a particular case could therefore be indubitably diagnosed as pseudo-science. Indeed, several decades ago Larry Laudan (1983) had already declared “The demise of the demarcation problem.”

Relatively sophisticated critics of radical unorthodoxies disclaim belief in scientism,<sup>1</sup> and they ignore or reject the points made by Laudan (and others). For instance, their criticisms of challenges to mainstream views may still invoke purported demarcation criteria like “the scientific method,”<sup>2</sup> or falsifiability, or science’s supposed automatic self-correction, none of

which have had any significant traction for decades within the philosophy of science or other informed discourse. A variety of more-or-less ad hoc sets of criteria have also been proposed at various times to characterize pseudo-science, but none have stood the test of being applicable only to “pseudo” and not to instances of “proper” science (Bauer 1984:142–148).

The purpose of this Essay is to illustrate the intellectual weaknesses and misleading contentions that seem inevitable when scientistic belief and faith in the possibility of demarcation underlie critiques of unorthodox claims. Such critiques amount to attempts to conjure certainty where there is actually none to be had. Since any such attempt contravenes sound thinking, the arguments made are perforce deceptive and misleading.

This Essay will first give a summary of the argument against the possibility of a definitive, indubitable demarcation of science from everything else. Then, there follow illustrations of the rhetorical trickery by which self-styled “skeptics,” here an activist philosopher and an activist lawyer, deploy sleight of words to give the impression that science can be unequivocally distinguished from imposters and that science should always be unequivocally trusted to be right.

### **The Demise of the Demarcation Problem**

The search for criteria to distinguish science unequivocally from non-science—the demarcation problem—is a priori unlikely to be successful. Sought is a rigorous set of criteria for defining a human activity that has changed over time and whose acknowledged components are diverse. Everyone agrees that chemistry, physics, geology, astronomy, biology—the physical sciences, sometimes called the “hard” sciences—constitute “science.” Yet commonalities cannot be identified within all the activities regarded as “proper” in those fields. Scientists do a variety of different things; they observe, experiment, theorize, etc. Even the conventional wisdom that science judges a theory’s validity empirically and pragmatically, by the evidence offered from the natural world, is not true of actual scientific activity, where theorists are likely to disbelieve experimental results that do not conform to contemporary paradigms (Bauer 1992:Chapter 2).

Science has grown and diversified explosively, especially during the last century or so, and it was not at all obvious earlier, say toward the latter part of the 19<sup>th</sup> century (Knight 1986), that it would be impossible to define science with logical accuracy. Indeed, several generations of philosophers of science, some of whom were also active scientists, worked at the problem. The definitive summary, cited by all who agree and also by those who disagree, was given by Larry Laudan (1983). Here is a synopsis of the argument:



At least since ancient Greece, “Western philosophers thought it important to distinguish knowledge (episteme) from mere opinion (doxa), reality from appearance, truth from error.” Over the centuries, and particularly in the Western world in the last half-millennium or so, “science” became equated with “knowledge,”<sup>3</sup> yet by the middle of the 19<sup>th</sup> century, it had also become clear that “science”—empirically derived knowledge about the world—is fallible: Theories (understanding) had to be modified every now and again. Since certainty did not work as the criterion for being “science,” efforts then focused on showing that science has a method that is better than all other approaches; however, from the beginning it was acknowledged not to be infallible. Moreover, no agreement could be reached about what the method was—naturally enough, given that scientific activity includes such a variety of different approaches.

Demarcation criteria must be both necessary and sufficient. If they are only necessary, then they cannot definitively pronounce something to be a science. For example, if it is claimed—as it often is by self-styled “scientific skeptics” and other pundits—that scientific results should be reproducible, that would be merely a necessary condition and would not even exclude mistakes, which are often reproducible. If criteria are merely sufficient, then they do not make it possible to designate something (say, astrology) as not-science or as pseudo-science: A sufficient condition for an activity being a game is that two teams try to outscore each other, but that alone would not suffice to account for why solitaire, singles tennis, or bingo are games.

Laudan then demonstrates that none of the suggested candidates for demarcation actually work: not “the scientific method,” not falsifiability, not the abhorrence of ad hoc adjustments to theory, and not the attempt to distinguish “progressive” from non-progressive research programs.

The upshot is a lack of definitive, indisputable, universally applicable criteria by which genuine science can be distinguished unequivocally from pseudo-science. In each specific case, detailed scrutiny is called for to assess the appropriateness of methods, the soundness of obtained data, and the validity of inferences and conclusions (Bauer 2001). Six-thousand-year creationism can be challenged legitimately on the grounds of fossil evidence, radioactive dating techniques, etc.; but simply pronouncing it “pseudo-science” is not legitimate unless one has shown why that label applies, and for that there are no available shortcuts, only the aforementioned route through fossils and dating, etc.

Another way to look at the issue is to note that “science” has the pre-existing meaning of biology, chemistry, physics, etc. Identifying the criteria or principles common to all of those is a problem of *induction*, and philosophy has long understood that induction cannot lead to an

unequivocally and universally applicable principle or criterion. To dismiss something as pseudo-science without examining its individual claims and the associated evidence would call for *deduction* from some universally applicable principles or criteria that define science, and induction cannot yield such criteria or principles.

All that can be achieved validly is to note, on every specific issue, how faithful to evidence and logic are all aspects of the investigation and of the conclusions drawn. One may then legitimately have grounds for concluding that the activity and its claims are more or less worthy of serious attention, but that remains a significant cry from true or not true: It remains a matter of probabilities, in other words fallible—*doxa* and not *episteme*.

### Conjuring Certainty

The ambition to label certain matters as pseudo-science stems from a wish to prove to everyone that those matters are misguided or downright mistaken in some manner, at any rate not to be taken seriously, let alone believed. Invoking the authority of science to that end, instead of arguing the detailed, specific validity of evidentiary claims, amounts to asserting the untruths that science is always trustworthy, that the contemporary consensus equals science, and that what science is can always be recognized unequivocally. Therefore, activists and vigilantes who seek to root out “pseudo-science” wherever they see it have to somehow show that probabilities of less than one can be legitimately equated with certainty. Since that is not logically possible, the pertinent literature is replete with sleight of words, rhetorical tricks, and polemic devices. The next section contains examples of this from a representative of “skeptics” groups who happens to be a philosopher, and from a lawyer concerned over the influence of unsound science in court cases.

A general tactic is to acknowledge the general fallibility of science and to follow that with the assertion that, however, *in this particular case and for all practical purposes*, established science should be granted unquestionable authority.

### The Philosophy of Pseudo-Science

The *Encyclopedia of Philosophy and the Social Sciences* has an entry for “Pseudoscience” (Pigliucci 2013) that illustrates the intellectual contortions of those who wish to dismiss subjects they regard as spurious by labeling them pseudo-science. The author is a philosopher by present profession as well as a card-carrying “skeptic”<sup>4</sup> who has published a flawed compendium of alleged pseudo-science (Pigliucci 2010).

Pigliucci admits Laudan's critique to be "important," but calls "much too restrictive and impractical" Laudan's conclusion that "epistemic warrant should be attached to specific claims, not to broad endeavors." Note that Pigliucci does not contradict the logical soundness of what Laudan says; but he evidently has practical aims that could not be pursued if Laudan's conclusions, unquestioned on philosophical or logical grounds, are accepted. Like other self-styled "skeptics," Pigliucci wishes to be able to dismiss whole fields as pseudo-science without taking the trouble to argue specific cases:

When a field like astrology has repeatedly, and for a long time, demonstrated its inability to make progress—due to the incoherence of its theoretical constructs (e.g., "constellations" are actually optical illusions) and its failure on empirical grounds—it seems the time has arrived to archive the whole thing as not warranting any more serious investigative efforts.

Note how many assertions here lack explicit support, how many critical points are left indefinite. Does "astrology" include the empirical data in which there seem to be correlations between positions or movements of the planets, sun, and moon on the one hand, and birth dates or times and personal characteristics on the other (Gauquelin 1991, Ertel & Irving 1996)? Why do these empirical correlations not constitute progress beyond the chart-drawing of centuries past? What is unscientific about using rigorous methods to study such correlations?<sup>5</sup> How long constitutes "a long time" in fields "like" astrology—and "like" in what respects? And when someone like Ertel or Gauquelin publishes an empirical set of data on astronomical entities and human behavior, can that be automatically categorized as "astrology"?

Grant that traditional astrology has failed on empirical grounds, but how can Pigliucci be sure that the fault lies in the "incoherence" of its theoretical constructs? Which constructs exactly? And what constitutes "the whole thing"?

Who is Pigliucci addressing here? No one is asking him to put "serious investigative efforts" into "astrology." But also, no one has given him a warrant to tell other people on what they should or should not spend their investigative efforts. Does he propose that the study of "astrology" be declared a socially abhorrent or even criminal activity?

Labeling something as pseudoscience—if called for—serves the same practical shortcut function of throwing an obviously frivolous lawsuit out of court before one invests money and time in something that has no chance of succeeding.

Again, the devil is in the details. What criteria are available to determine whether that label is “called for”? The analogy with “obviously frivolous” would only hold if it were shown—demonstrated, not merely asserted—that the alleged pseudo-science is “obviously” so unfounded as to have “no chance of succeeding.” For that matter, are “obviously frivolous” lawsuits so easily classifiable as “frivolous”?

Pigliucci here admits explicitly that the “practical shortcut function” is just an attempt to avoid having to bother with proving the case through attending to the specific details of the claims. If those details are “obviously” unsound in some manner, why not simply list them and say why they are “obviously” faulty? If something is obvious, why is a shortcut called for?

It gets worse, if that seems possible:

The current philosophical literature on pseudoscience is exploring some of the alternatives to the classical demarcation approach briefly mentioned above such as solutions based on fuzzy logic or on making more precise the notion of Wittgensteinian family resemblance concepts . . . The abandonment of the quest of necessary and jointly sufficient criteria to define science and pseudoscience in favor of, for instance, Wittgenstein-type family resemblance (“fuzzy”) concepts, constitutes progress, not failure.

Since “family resemblance” needs to be made “more precise,” it evidently isn’t precise as it stands, and yet it is exactly precision that is called for before asserting unequivocally that something is or is not science or is or is not true. “Family resemblance” may not amount just to “I know it when I see it,” but it is no answer to the demarcation problem. Implying that it offers hope toward that is misdirection. “Fuzzy logic” is itself already semantic misdirection, because it is nothing like the common understanding of “logic” as precise and infallible. In what way could having only a “fuzzy” way of identifying pseudo-science constitute progress over definitive criteria?

It does so only in the sense of being faithful to the reality that definitive criteria are not to be found, which is not Pigliucci’s intended meaning.

There are no grounds on which to quarrel with philosophical discourse aimed at better defining what can be done with the concepts of family resemblance and fuzzy logic. But Pigliucci’s aim is to be able to pronounce something as *unequivocally* pseudo-science, *unequivocally* not worth paying any attention, *unequivocally* without truth value, in order that the conventional wisdom and public policies should be shaped accordingly. To that end, asserting as progress the replacement of precise criteria by imprecise resemblances is just another rhetorical trick to inveigle the reader into forgetting that the warrant for unequivocal categorizing is lacking.

### Junk Science in the Courtroom

Peter Huber (1991) expresses amply justified disgust at some of the results of court cases in which sound, scientifically based knowledge was brushed aside. A fine example is Charlie Chaplin being forced to pay a settlement for fathering a child who could not have been his, as demonstrated by blood typing. Such junk-science verdicts were becoming common (in 1991), according to Huber.

Unfortunately, Huber equates sound knowledge with science, and science with what the consensus happens to be at any give time. So, like philosopher Pigliucci, lawyer Huber engages in rhetorical excesses, unwarranted analogies, and generalities instead of specifics as he tries to argue that keeping junk science out of the courtroom means always accepting the contemporaneous consensus in the pertinent scientific discipline. Perhaps that is why he seems to accept as proven (Biello 2009) the unproven (Bauer 2012b) hypothesis that carbon dioxide is causing global warming.

Certainly there have been court cases, cited in detail by Huber, where plaintiffs collected damages and corporations paid additional punitive fines just because it *might* be that, for instance, environmental pollution could cause cancer and other ailments. To my mind, the appropriate solution would be that the lawyers in each such case be sufficiently knowledgeable as to be able to find the right expert witnesses and to cross-examine the plaintiff's witnesses in ways that would expose the dubiousness of their testimony. Instead, Huber wants to take shortcuts, like declaring as junk science all such claims of environmental harm: "Take the serious sciences of allergy and immunology, brush away the detail and rigor, and you have the junk science of clinical ecology" (Huber 1991:2). Might Huber rethink his dismissal of environmental chemicals as a cause of cancer now that the World Health Organization has asserted unequivocally that they are (Brumfield 2013)? If not, why reject the official mainstream view now when he accepted it earlier?

Huber (1991:3) also contrasts properly scientific physical therapy with the junk science of chiropractic, and the properly scientific orthopedic surgery with the junk science of osteopathy, yet osteopathic doctors are fully licensed to practice medicine and to dispense drugs, and chiropractic has fared at least as well as mainstream therapies in clinical trials about coping with lower-back pain (Rubinstein, van Middelkoop, Assendelft, de Boer, & van Tulder 2013).

These examples illustrate that Huber regards as unproblematic the issue of distinguishing proper, sound science from junk or pseudo. As I have already pointed out, this is a serious error. Huber commits it consistently by taking the established, accepted, mainstream view as authoritative. For

instance, he approves “the hope that, with the help of determined judges, the legal consensus would in time converge with the scientific one” (Huber 1991:14).

Huber’s (1991:194 ff.) section on “Science as consensus” argues at length for equating consensus with science. Michael Crichton’s (2003) take on this cannot be cited too often:

Whenever you hear the consensus of scientists agrees on something or other, reach for your wallet, because you’re being had . . . If it’s consensus, it isn’t science. If it’s science, it isn’t consensus. Period . . . Consensus is invoked only in situations where the science is not solid enough. Nobody says the consensus of scientists agrees that  $E = mc^2$ . Nobody says the consensus is that the sun is 93 million miles away. It would never occur to anyone to speak that way.

Consensus in the scientific community also governs peer review, which is often cited as a guarantee of the soundness of science. As an editor of *Lancet* has pointed out, however (Horton 2003:306), “Peer review . . . is simply a way to collect opinions from experts in the field. Peer review tells us about the acceptability, not the credibility, of a new finding.”

Accepting the mainstream consensus as indisputably true is an unwarranted shortcut to evade having to prove a specific case by employing general categories (Huber 1991:214–215): “Are there then any real differences between astronomy and astrology, chemistry and alchemy, immunology and clinical ecology, pharmacology and homeopathy, mathematics and numerology?”

Of course there are; they are built into our definitions of those names or activities. But disputes about specific claims are not about such distinctions. To discredit a particular claim, it should not be enough to label it “clinical ecology” or “alchemy;” the hard work ought to be undertaken to show how and why this specific claim belongs in the discredited category. That hard work is what Pigliucci, Huber, and other “skeptics” and pundits seek to evade by applying labels that have not been individually argued and justified. Thus the pejorative “alchemy” has been directed at individuals who offer evidence of the transformation of one element into another under conditions of “cold fusion”<sup>6</sup> that employ electrical or sonic energy; whereas no objections are raised to evidence of the transformation of one element into another in nuclear reactors, bombs, and particle accelerators, the latter of which also depends on the application of electrical energy. What then is the criterion for labeling something alchemy, if it isn’t the transformation of one element into another? Clearly enough, Huber is just accepting the contemporaneous consensual judgment of the established mainstream, not

bothering about how any given claim could be classed as “alchemy” in contrast to “chemistry” or “(nuclear) science.”

Perhaps Huber should apply to scientific disputes the same logic that applies to the use of prejudicial evidence in court. It is not usually permitted to cite a defendant’s prior record of charges or convictions, so that only matters directly pertinent to the present, new charge should be taken into account. In other words, people should not be found guilty just because they are “the sort of person who commits this sort of crime;” their guilt should be judged specifically in relation to the present particular crime. By analogy, one ought not to label something as junk science just because it seems like “that sort of thing” in the eyes of some people, even if that is the consensus of an established community; every unorthodox claim or minority view in science ought to be judged purely by the specific evidence pertinent to the specific claim.

This point becomes even more important because there are such widespread misconceptions about what science actually is. Huber’s book illustrates some of these, e.g., that there are unproblematically objective facts whose significance is independent of any theoretical framework or mode of interpretation (Huber 1991:218–219). A judge is cited approvingly for denying that mainstream scientists are prejudiced against important new ideas: It would be “inconceivable that such a looseknit group of independent thinkers in all the varied fields of science could, or would . . . effectively censor new scientific thought” (Huber 1991:219). “Modern” scientists are not dogmatic about their beliefs, according to Huber (1991:221). That judge, Huber, and all too many pundits, “skeptics,” and others would benefit from familiarity with Bernard Barber’s (1961) classic article, “Resistance by scientists to scientific discovery”: The mainstream consensus is always dogmatically sure, a priori, that contrarian claims are wrong (see also Hook 2002).

Like Pigliucci, Huber (1991:223) insists that “lines can and must be drawn . . . [s]haggy edges notwithstanding”—one can legitimately speak of “junk” science just as the term “junk bonds” is used in the absence of characteristics that clearly, objectively distinguish them from non-junk bonds. One can rely on the independence and wisdom of judges and scientists “to get the facts right” (Huber 1991:223–224). But whether lines can or must be drawn is a different question in scholarly discourse than in social action and the making of public policy. In academe and intellectual discourse in general, drawing the wrong lines causes no direct harm, whereas drawing the wrong lines could be catastrophic in matters of economic or environmental policies—or on going to war.

“The modern judge who defers to mainstream science will at the same

time defer to science's own, methodical acceptance of the possibility of error. To insist that things are more uncertain still is to deny things we know to be true" (Huber 1991:226). Again, typically, it is acknowledged that science is fallible, and because scientists know that therefore what scientists say can be trusted. One might legitimately call this turning of logic on its head casuistry or sophistry.

False analogies support this invidious rhetoric. "If we can't say what is fact and what is fantasy, how can we challenge the next demagogue who declares that the Jews are plotting against the Reich?" (Huber 1991:227). We can and should challenge such statements by looking at the specific evidence, not by calling them fantasy because we supposedly know fantasy when we see it.

This lawyer "doth protest too much, methinks,"<sup>7</sup> because he cannot stop insisting that lack of certainty is no barrier to being certain. "Let us concede one last time that the difference between dream and reality is itself uncertain [is it really?], that absolute certainty is always unattainable"; nevertheless in practice one should act as though one were absolutely certain:

The best test of certainty we have is good science—the science of publication, replication, and verification, the science of consensus and peer review; the science of Newton, Galileo, and Gauss, Einstein, Feynman, Pasteur, and Sabin . . . the best test of certainty so far devised by the mind of man. (p. 228)

But the science of those eminent people was not accepted by contemporaneous peer review when they first proposed it (Barber 1961); moreover, replication hardly ever features in science because there are no rewards for it, and the philosophy of science has long acknowledged that verification is a logical impossibility.

### **The Media**

The mass media are, by and large, acolytes of the shamans of scientism: They parrot whatever the consensus of an established scientific community happens to be. A fine illustration is the decision by *The Los Angeles Times* not to print any more letters questioning the mainstream dogma that global warming or climate change is being caused chiefly by human activity that generates carbon dioxide (Thornton 2013):

[W]hen deciding which letters should run among hundreds on such weighty matters as climate change, I must rely on the experts—in other words, those scientists with advanced degrees who undertake tedious research and rigorous peer review. And those scientists have provided ample evidence that human activity is indeed linked to climate change. Just last



month, the Intergovernmental Panel on Climate Change—a body made up of the world’s top climate scientists—said it was 95% certain that we fossil-fuel-burning humans are driving global warming . . . Saying ‘there’s no sign humans have caused climate change’ is not stating an opinion, it’s asserting a factual inaccuracy.

I suspect Thornton does not take the same stance of deferring to the experts on matters of, say, economics. There he probably feels able to accept the expert advice of (say) liberal or progressive economists while dismissing the biased opinions of conservative economists (or vice versa). Since there are thousands of competent climate scientists who disagree with the mainstream consensus on global warming, on what basis does Thornton dismiss their opinions? Because they too can be labeled “conservatives” (Bauer 2012b), like for example Frederick Seitz, a former President of the National Academy of Sciences and a former President of Rockefeller University?

Sadly, all too many people stop trying to think when something “scientific” is asserted by “experts,” especially when they use phrases like “95% certain.” Yet it should take very little thought to ask just how such a probability could possibly be calculated. Merely asking the question brings an easy answer: There is no way to estimate the probability that there exists no presently unknown variable, and therefore there is no way to calculate a probability of being right as opposed to wrong, and no way to be sure that one is not wrong, even, perhaps, “100% wrong”.

### **In a Nutshell**

Determined advocates of certain policies and actions support their positions by invoking what “Science” says. As a surrogate for actual scientific evidence, the contemporaneous view of the visible majority of established mainstream experts is invoked. However, since it cannot be gainsaid that science is fallible and that contemporaneous consensus were often later superseded or vitiated, the advocates have to resort to misdirection, employing technical jargon like “fuzzy logic” to induce the laity to accept their interpretations as definitive, to accept somehow that “uncertain” could mean “certain,” that a probability could be converted into a certainty. Such misdirection seems particularly reprehensible when engaged in by philosophers or by lawyers, whose professional responsibility it is to know better, to know what an intellectually sound argument is and what is not one.

What is appropriate in academic discourse may be inappropriate in the sphere of public policy. Mistakes made in the trial-and-error processes of

scholarly and scientific research cause no immediate widespread damage, but injudicious public policies and actions may bring highly damaging social consequences in short order. The desire for a contemporary scientific consensus to be accepted as the universally valid guide to public actions does not originate in the intellectual environment of scientific activity, but rather from the wish of a few activists within and outside the scientific community to find backing for their desired social actions. In placing social activism before intellectual rigor, such activism does a disservice to both science and other intellectual disciplines as well as to public discourse and policymaking.

### Notes

- <sup>1</sup> However, the prominent “skeptic” Michael Shermer (2002) actually praises scientism and its proponents.
- <sup>2</sup> “I would strongly recommend this book [Bauer 1992] to anyone who hasn’t yet heard that the scientific method is a myth. Apparently there are still lots of those folks around” (Goodstein 1992).
- <sup>3</sup> Indeed, in German, *Wissenschaft* means knowledge and *Naturwissenschaft* stands for science.
- <sup>4</sup> <http://www.platofootnote.org>
- <sup>5</sup> <http://www.astrology-research.net/rgcsa.htm>  
<http://www.astrology-and-science.com/hpage.htm>
- <sup>6</sup> Proponents now often call this putative phenomenon LENR, for “low energy nuclear reactions,” or CMNS, for “condensed matter nuclear science.”
- <sup>7</sup> After “The lady doth protest too much, methinks”: Shakespeare, *Hamlet*, Act 3, Scene 2, p. 230.

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## OBITUARY

### Eileen Coly (1916–2013)

It is with a sad heart that we write about Mrs. Eileen Coly, past president of the Parapsychology Foundation (PF), who passed away on November 18, 2013, after a long service to the field of parapsychology. We first met her during a Parapsychological Association convention in the mid-1980s, and got to know her a little bit better in 1986 when we stopped off to visit the PF, were ushered into her office, basked under her meaningful smile, and were both pleased and startled when she said “We’ve been watching you two.” But we really got to know her during 2000 to 2003 when we worked for the PF in



**Eileen Coly on her 97th birthday.**  
Photo credit: Robert Narholz

New York City. Many are the memories we have of her personality: She was charming but serious, a woman with a biting and intelligent sense of humor and an enormous amount of spunk that not everyone in the field got to see.

Mrs. C., as we called her—although others called her Babs—was the daughter of Eileen J. Garrett, the first President of the PF (founded in 1951) and a well-known medium, publisher, and businessperson. After her mother’s death late in 1970, Mrs. C. assumed the leadership of the PF.

Born in England in 1916, Mrs. C. worked early on as a traveling companion and assistant to Mrs. Garrett. During World War II, Mrs. C. stayed in England and was separated from her mother. Later on, in 1947, she went to live in the United States working in two of Garrett’s early projects, Creative Age Press and *Tomorrow* magazine. Furthermore, Mrs. C. was a member of the PF’s Board of Trustees, something that must have helped her to understand the organization when she became its President after Garrett’s death.

When people think of the contributions the PF has made during its history, they tend to talk about Eileen Garrett. But almost everybody forgets that Mrs. C. was President of the Foundation for more than twice as many

years as Garrett served, and that she led the PF very effectively, continuing its well-known programs to support the field via grants, conferences, and publications.

Mrs. C. was a no-nonsense person. She had a straightforward approach to life and a talent, as we saw more than once, to just “cut through it” when a decision had to be made about PF affairs. At the same time she was not dogmatic. She solicited and carefully considered opposing opinions and new ideas, and was not at all adverse to giving a fair chance to other ideas or to changing her own views. We saw this process many times when Mrs. C. and her daughter Lisette Coly, the current President of the Foundation, discussed the PF’s affairs in our presence, and when they invited us and other PF staff into the conversation.

Many workers in parapsychology benefited from her administration of the PF, particularly in the form of grants. Some of the grants processed during Mrs. C.’s time as President were bestowed on the who’s who of parapsychology in modern times, many of them well before they became known. On Mrs. C.’s watch, the Foundation—taken from the 1975 annual report—gave grants to, among others, Heinz Berendt, C. T. K. Chari, Yvonne Duplessis, Charles Honorton, Robert Morris, Russell Targ and Harold Puthoff, and Charles T. Tart. The 1978 report listed John Beloff, James Carpenter, Irvin Child, John Palmer, William Roll, Rex Stanford, and Rhea White among the grantees.

Mrs. C.’s work, sometimes invisible, was geared toward supporting the field in its scientific, scholarly, and educational endeavors, a task she accomplished well and with modesty. When we came to work onsite in New York, Mrs. C. was already in her late eighties. She was less active then, but no less pivotal to the important decisions, no less in charge. We were all grateful for her guidance, and loved that she often started her comments on Lisette’s plans or our suggestions with “Now, children . . .” There wasn’t ever a hint of a put-down in that phrase. It was just an affectionate reminder—even though we were all heading into our 50s—that something important that grew out of her long experience with the field was about to be said.

Many conferences were held under Mrs. C.’s tenure as PF’s President. Among them were: *Parapsychology and the Sciences* (1972, Amsterdam); *Parapsychology and Anthropology* (1973, London); *Quantum Physics and Parapsychology* (1974, Geneva); *Psi and States of Awareness* (1977, Paris); *Parapsychology, Philosophy, and Religious Concepts* (1985, Rome); *Spontaneous Psi, Depth Psychology, and Parapsychology* (1987, Berkeley, CA); *Psi and Clinical Practice* (1989, London); *Women and Parapsychology* (1991, Dublin); *The Study of Mediumship: Interdisciplinary Perspectives*

(2005, Charlottesville, Virginia); and Utrecht II: Charting the Future of Parapsychology (2008, Utrecht).

In addition to conference proceedings, publications under Mrs. C.'s administration included most of the PF's magazine *Parapsychology Review*, and additions to the *Parapsychological Monographs* series of the PF. Some examples of the latter were *Experimental Studies of the Differential Effect in Life Setting* by P. Sailaja and K. Ramakrishna Rao (1973), *Methods and Models for Education in Parapsychology* by D. Scott Rogo (1973), *The Application of Learning Theory to ESP Performance* by Charles Tart (1975), *The Paranormal Perception of Color* by Yvonne Duplessis (1975), and *Altered States of Consciousness and Psi: An Historical Survey and Research Prospectus* by Edward F. Kelly and Ralph G. Locke (1981, reprinted with a new introduction in 2010).

Eileen Coly's contributions to the advancement of parapsychology are undeniable and of a magnitude that our brief comments cannot possibly acknowledge properly. Those of us who met her and knew her will also remember, and always miss, her insightful, witty, and charming personality. Her presence enriched our lives and will not be forgotten.

**CARLOS S. ALVARADO AND NANCY L. ZINGRONE**  
Rhine Research Center

## ESSAY REVIEW

### Two Perspectives on Possession

**Possession & Exorcism: Understanding the Human Psyche in Chaos** by Hans Naegeli-Osjord. New Frontiers Center, 1988. 186 pp. ISBN 978-0945831013.

**The Devil Within: Possession and Exorcism in the Christian West** by Brian Levack. Yale University Press, 2013. 360 pp. \$40.00. ISBN 978-0300114720.

The phenomenon of possession has a long, complicated history and a dark, unsavory side. Nevertheless, it has persisted in one form or another until present times. The books under review afford two perspectives on demonic possession: psychiatric and historical. Both authors are informed in their respective fields. They are critical writers and agree on a basic factual underpinning of the controversial phenomena. The grounds for this concord lie in the recurrence of the phenomena and the cumulatively large number of recorded witnesses.

Both are aware of the academic prejudice toward the alleged realities of possession. Historian Brian Levack is interested in the historical and performance dimension of the untoward effects, and plays down their ontological strangeness and implications. The Swiss psychiatrist Hans Naegeli is more concerned with these implications, for example, for psychiatry, noting the unhelpfulness of standard materialist outlooks. The books are mainly complementary and affirm the reality of some of the strangest phenomena in the history of psychophysical anomalies.

Naegeli's book was published in 1988, so let's begin there. Concerning a case of possession that ended in the courts, he writes: "I do not doubt at all the possession of Anneliese by transcendental demonic spirits" (p. 132). Naegeli thinks that the evidence for possession cases is evidence for discarnate existence and agency. In his ontology, we find claims not only for ordinary incarnate souls surviving but also for pure spirits and archetypes that act as agents of demonic destruction. However strange this sounds, there are enough stories to make the reader wonder.

On the basis of historical study and on all he has personally witnessed, Naegeli holds that no argument based on the personal unconscious could

account for the sheer otherness of the possessing personality. He was not alone in this view. Raymond Firth wrote in the foreword of *Spirit Mediumship and Society in Africa* (1969):

Sometimes it has been hard for the anthropologist to persuade himself that it is really the same person as before whom he is watching or confronting, so marked is the personality change. (p. x)

There are, moreover, specific details that reinforce this impression of otherness. The possessed subject is reported to speak in languages unknown to him or her such as Latin, Greek, Hebrew, etc. Known as *xenoglossy*, this is important because language-speaking ability cannot be explained by telepathy or the ingenuity of the unconscious.

The possessed person behaves in ways that are totally alien to his usual self. He (or more probably she) blasphemes and acts out violent loathing of the conventional sacred symbols; is, moreover, tormented by physical contact with them; demoniacs recoil in pain from holy water sprinkled on them (think of actor Bela Lugosi shrinking from the sight of a cross or mirror). The moral otherness of demoniacs *looks like* an invasion from without; to view it as “merely” a revelation of something repressed within is no less uncanny. Can such total antagonists to our normal being really be lurking in our subliminal selves? Another symptom of possession is said to be the preternatural strength displayed by demoniacs. Naegeli thinks that these are earmarks of something intruding itself *from outside into* the possessed person.

He therefore finds the prevailing psychiatric paradigm wanting for a basic reason: It leaves out the psyche and all its peculiar problems. He feels that we need to expand our vision of human personality and also our concept of the healing arts. The demoniac world that Naegeli exhibits is a world in turmoil; the possessed are also the dispossessed, people whose souls have been raped, violated, wounded.

Naegeli and C. G. Jung share the assumption that to understand the human psyche it is best to observe it *in extremis*. Extreme states often reveal the hidden potentials of mental life. Examples would be unexpected moments of inspiration, near-death experiences, and prophetic, shamanic, and mystical states. All these are known to give rise to extraordinary, transformative experiences. Possession is another form of psychic extremism that offers material for reflection. However, it is one that forces us to reflect on the disturbing outer limits of human personality.

The book offers a wealth of German sources for the phenomena, new to Anglophones; and has an excellent foreword by the historian Martin



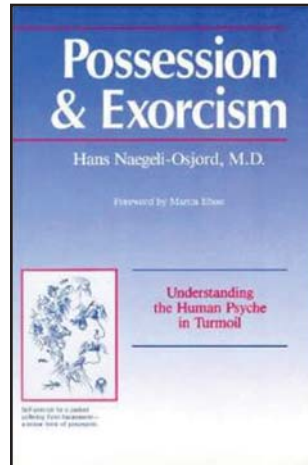
Ebon. Naegeli had various suggestions for how psychiatry might advance; e.g., he emphasized the importance of “subtle bodies” to aid our grasp of demonic influence. He also argues that some forms of possession may be positive, which in turn he linked to the polarity of psychic function. If demonic forces can possess us, why not angelic forces? Naegeli, I should add, witnessed many of the phenomena described in his book. Because of his experience he entertains strong and independent views, but he never comes across as dogmatic or inflexible in his views.

Naegeli’s study led him to acknowledge the power of polarity in the psychodynamics of possession. He inferred two practical points from this. First, the higher the saintly aspiration, the more the Devil is moved to spring into action: Challenges increase as one moves toward perfection. Second, and more general, the polarity is essential to the life of the dialectic, the creative struggle to maintain the balance of opposing forces.

The book has twenty chapters, and is broken down into two parts. The first ten chapters cover the history and modern views of possession, basic ideas like the demonic, good and evil, and the positive forms of possession as noted. Three chapters deal with types and techniques of exorcism. For the psychiatrist this is the heart of the matter: Given the various forms of possession, obsession, harassment, and infestation, the psychiatrist sometimes has to be an exorcist. In Chapter 10, he discusses medical exorcism, Brazilian models, and the method of the American doctor Carl Wickland. Naegeli describes his own method of exorcism, which borrows from Catholic procedures (he’s not Catholic, he says), using, for example, “holy” or blessed water and images and invocations of St. Michael the Archangel.

He discusses the work of Wilson Van Dusen, who developed methods for interrogating the hallucinations of psychotic patients and found there were two types (that seemed to conform to Swedenborg’s model): the common type of low-grade, chattering destructive voices, and the higher, silent archetypal hallucinations that served to guide, strengthen, and encourage patients.

The second half of the book consists mainly of detailed descriptions of possession cases. One of the most detailed was published in 1882 by Pastor Blumhardt of Zürich. A girl, Gottliebin Dittus, was victimized by



hauntings, noises, and blows from burning hands that marked her body; she spoke in different languages; her body became bloated; physicians could not understand why she vomited “buckets” of water, while “unimaginable amounts of blood flowed from body openings and gushed from a point high in the middle of her head” and there were “the repeated emission of crooked, rusty nails, pins, sewing needles and pieces of iron” (p. 73) from her mouth.

Other effects were said to “surpass every human capacity” that involved “paranormal materialization or apport phenomena.” Gottlieb is said to have gone on clairvoyant excursions to Far Eastern countries in which she witnessed and described volcanic eruptions and sea-quakes exactly as they were reported in newspapers days later. I am touching lightly on the actual reports in this one case that surely boggles the imagination, and leave it to the reader’s discretion to confront and ponder the original materials.

As I said, the book provides report after report of truly bizarre possession-related phenomena, many observed by the author, especially cases of “harassment” and “infestation” that are slightly less severe types of possession. (In “true” possession, the mind of the host body is fully expelled, but not in harassment or infestation.) Chapter 13 is titled “Unusual Cases of Possession,” involving groups of boys (the famous Illfurt case) or nuns (of Loudun and other locales). Naegeli concludes there are probably many more hidden cases of the possession type that go unnoticed or unreported because such things are not supposed to be possible according to the then-prevailing outlook.

Our second, historical perspective on possession does nothing to take the edge off Naegeli’s broad claims, despite the different emphasis and approach. I cannot cover the rich detail of Levack’s study, but will make two main points: one on the “symptoms” or characteristics of the alleged possessions, the other on the author’s concept of possession as performance.

In modern secular times, demonic possession is usually explained as the result of fakery or physiological disease. While some cases, or parts of cases, may so be explained, they fail to account for all reported cases. Levack’s book is on possession and exorcism in the Christian West. Broadly, he demonstrates the autonomy and persistence of possession from ancient to modern times, while showing in detail the ways culture and thought-world shape the occurring experience. It makes a difference if the possession is politically implicated with witchcraft or not; if it is experienced through the psychic lens of a Catholic or a Protestant; if it occurs before or after the rise of seventeenth-century mechanist science, and so on.

Chapter 1 gets right to the heart of our concern: It describes the sixteen or so “symptoms” that identify an incident of possession. (Not every case of possession displays all the symptoms.) The term *symptom* and the frequent

use of the term *pathology* are too sweeping and premature, however. A more neutral term like *sign* or *indicator* seems better. And for *pathological*, I would simply say *extraordinary* or *strange*. Pathologizing terminology gives a comforting sense of classification; to say something is an illness can be a way of writing it off.

Levack, however, is no reductionist; but, unlike Naegeli, he is not concerned with exploring the unexplained or truly strange features of possession; therefore, he discreetly brackets the problem, and gets on with the historical issues and complexities that most interest him. But Naegeli is eager to confront and make a sharp detailed issue of the outlandish phenomena. This may have been caused by an appropriate sense of urgency he felt in light of his role as psychiatrist, i.e. as a “soul-doctor.”

Levack’s list of symptoms is consistent with Naegeli’s account of the basic historical facts. Levack is very careful to list all the good reasons for doubting the claims regarding them, but

... authors may have exaggerated the activities they had witnessed or read about, but they had little reason to invent the entire narrative ... accounts of possessions that were witnessed by large numbers of people, sometimes in public venues, must be granted at least a measure of credibility, especially when observers who disagreed on the causes of the demoniac’s behavior did not deny that they had witnessed it. (p. 5)

The sixteen signs of possession may be grouped as changes mainly of physiological function, but also changes of cognitive and of moral function. It appears as if an external force has indeed taken physical and mental control of the possessed person, in the course of which it stretches and deforms her body beyond its normal appearance and capacities. Convulsions are the first indicator of the apparent alien invasion, the effects of being crashed and seized by a massive, unwieldy energy from outside—(or at least, from *down there*, in the subliminal psyche). Subtle and soul-shattering pain is a plausible correlation of convulsions. Demoniacs suffer all manner of hideous pain. One Venetian demoniac called her assailant *La Draga*. Her pain annihilates her. “He eats my guts and destroys my legs and my throat and he takes my memory, and he does not let me eat, and he wishes to kill me” (p. 6).

The next two signs are a team: rigidity of limbs and the muscular flexibility of a master contortionist. The pair indicate a polarity at work, the body’s potential ranging from super-ordinary stiffness to waxy flexibility. The possessing agent seems to be showing off, that is showing mastery over the shape and texture of embodied existence. Another physical symptom is a game-changer—levitation, preternatural lightness, which may also manifest as preternatural heaviness. Demoniacs levitate, but so do their

polar opposites, saints and mystics. In possession states, something seems to be playing with gravity, reducing or intensifying it at will.

Next to this playful treatment of gravity, we're not surprised to learn that another indicator of possession is the acquisition of preternatural strength. For example: "One of the nuns possessed at Auxonne in 1658 was reported to have hoisted a heavy marble vase full of holy water with two of her delicate fingers" (p. 8). As many as five men have proven unable to pin down a possessed girl.

Still summarizing the physical signs of possession, Levack moves on to the more grotesque; and indeed the next two also are connected: swelling and vomiting. More frequent than levitation are reports of demoniacs in Scotland and Mexico whose eyes, tongues, and stomachs swell to the point of deforming them, only to return to normal size at the touch of a relic or holy water. Swelling suggests an alien presence pressing and deforming from the inside out; in the next symptom, the force expels or regurgitates alien objects, commonly pins and needles. However, "the (full) list of ejected substances includes nails, glass, blood, pottery, feathers, coal, stones, coins, cinder, sand, dung, meat, cloth, thread, and hair" (p. 9). Naegeli's study describes the same type of report, which, if real, a parapsychologist would describe as about "apports" or "materializations."

Levack describes another symptom as "loss of bodily function." This is the polar opposite of preternatural strength; the demoniac temporarily loses her sight, hearing, or (often) voice. There may be loss of feeling, hence impassivity to pain; this loss may blend into a kind of catatonic receptivity, in which possession may shade into ecstasy. Sometimes the loss of voice leads to another indicator of possession; a new voice is heard, deep and animal-like, utterly unlike the voice of (say) a young boy or girl. Moreover, the new voices apparently are projected from different parts of the body; from the stomach, for instance, or throat but without any movement of the lips. It is as if the vocal emanations of the organism have temporarily become nonlocal or at any rate been delocalized.

One indicator in particular of possessed states suggests discarnate agency. Demoniacs reportedly speak in languages—Latin, Greek, Hebrew, Polish, etc.—unknown to them. It appears as if an entity that did know how to speak the languages possessed the brain and vocal chords of the demoniac. Conceivably, the entity might be an angel, a demon, or an excarnate human.

The ability to speak in a foreign language is a cognitive sign of possession, to which we may add "trance experiences and visions," a "symptom" also found among enraptured saints and mystics. Also among the signs we find clairvoyance—used loosely to denote a general expansion of the direct outreach of consciousness.

Finally, there are certain dramatically counter-moral indications that behavior is caused by an alien will and force; these clearly give the impression of seizure by an external agency. The possessed demoniacs pronounced curses, blasphemies, heresies, and obscenities; and they recoiled in pain from relics, holy water, or any sacred symbol. These behaviors also seemed to be dramatic proof of the presence of an alien personality. Whether or not that is so is up to the reader to decide; what we can say is that historian and psychiatrist agree on taking seriously an elusive factual basis as somehow underlying all the strange reportage.



Levack shows how the basic phenomenon, although recurrent even to the early twentieth century, is interpreted differently in different cultural milieus—Catholic, Protestant, modern scientific, and so forth. The meaning and dramatic intensity of possession phenomena fluctuate depending on the specific historical context.

Given the historical data, the author develops an explanatory apparatus based on the idea of collective performance art, in which all the players have scripted roles to perform. It accounts, he asserts, for fake as well as authentic cases of possession. His argument is compelling in several ways, and in one way it contributes to solving the mystery of the strange preternatural phenomena we are stressing in this review. To identify effectively with a role one is playing, one must—especially in the “play” of possession—believe, intend, and imagine vividly from the inside the part one identifies with.

But these, interestingly, are the psychological variables associated with superior performance in psi-testing, i.e., the so-called “sheep-goat” effect. According to this effect, people who believe they can succeed in a given psi-task, that is who hope, expect, and can imagine such success, are more likely to succeed than people who do not believe, intend, or imagine that such and such is possible.

The combined testimony of the two books suggests that close to the shadow side of the human psyche may lie unknown realms of power, intelligence, and creativity. The concept of possession is related to the idea of secondary and multiple personality and points, theoretically, toward a more elastic notion of self and personality. The elasticity of self may involve (symbolically) downward and upward movements, reflecting an underlying dialectic. The variations of downward possession would include various

shadings such as obsession, harassment, and infestation (see the last half of Naegeli's book); we may be obsessed or harassed and still possess self-awareness, but the latter is lost in possession.

Naegeli and Levack advert to "positive" forms of possession. It is curious that raging demoniacs shrieking hatred and revolt against the traditional sacred concepts are reported to levitate; while some of the best evidence for levitation also comes from the Catholic saints, morally the polar opposites of the demonically possessed. The mystical are in a rapture of unity with the same God, Madonna, and symbols that torment the levitating demoniacs. Is this a dramatic illustration of what some call the *coincidence of opposites*?

As for positive possession, we might at least say one or two things. There is a sense in which anything that deeply and centrally occupies our attention *possesses* us. We are all in different ways possessed by the world around us—whatever seizes our consciousness: the events, the oppressive or privileged economics, the circumambient imagery (horrid or exalted). The personalities and institutions that rule the culture possess us, dominate our attention, again in varying degrees. We are all more or less possessed by something. Most of the time it is our own ideas and obsessions that possess and dominate us most powerfully.

Not surprisingly, there are many who seek to be possessed by something positive and higher than themselves. There are ways of doing so and books have been written on this. People have discovered—been seized by—or actively engaged the higher, the positive forms of possession, or to use a more positive term, *ecstasy*. One thinks of the tradition of prophecy, about which we know a great deal from the Bible, where the prophet becomes an instrument for the revealing words of Yahweh. This is possession that specializes in speaking truth to power (e.g., in the early twenty-first century, Noam Chomsky and Chris Hedges). In the classical world the oracles and sibyls and pythia were possessed by their various presiding divinities. According to Heraclitus, "The Sibyl with raving mouth, uttering things mirthless, unadorned and unperfumed, reaches over a thousand years with her voice through the god." Possession here is linked to freedom from the constraints of time. More modern mediums have teamed up with psychical researchers to produce and assess evidence for the survival of consciousness; the medium has a gift for being possessed by discarnate agents, with the express purpose of producing proof of their postmortem survival. An important, practical type of possession.

Finally, the entire enterprise of mysticism, as a practice, is tied to the idea of ecstatic release from our everyday self by our divine over-self. Mystical possession seems the most interesting type of possession; the most

attractive, certainly, when compared with the sort known for vomiting pins and needles.

My conclusion from the two studies of possession: The phenomenon (or family of phenomena) represents an unmined mystery of human behavior, which, if we follow the trail, might conceivably take us on a fabulous journey from the inferno to the paradiso of the psyche.

**MICHAEL GROSSO**

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## BOOK REVIEW

**The Deliberate Corruption of Climate Science** by Tim Ball. Mount Vernon, WA: Stairway Press, 2014. 298 pp. \$22.95 (paperback). ISBN 978-0988877740.

My first encounter with Dr. Tim Ball was while watching him in the BBC documentary *The Great Global Warming Swindle*, released in 2007. In a cast that listed, among others, well-known climate skeptics such as the Canadian environmentalist Patrick Moore, former member of Greenpeace; Richard Lindzen, professor of meteorology at the Massachusetts Institute of Technology; Patrick Michaels, Research Professor of Environmental Sciences at the University of Virginia; Nigel Calder, Editor of *New Scientist* from 1962 to 1966; John Christy, Professor and Director of the Earth System Science Center at University of Alabama; Paul Reiter of the Pasteur Institute; former British Chancellor of the Exchequer Nigel Lawson; and Piers Corbyn, a British weather forecaster, Dr. Tim Ball was a pleasant surprise for me. Well-articulated, with a sense of humor that was difficult to ignore, Dr. Ball brought a voice of reason to the heated debate on anthropogenic global warming (AGW).

His recent book, *The Deliberate Corruption of Climate Science*, describes a collection of specific cases where, according to Dr. Ball, blatant corruption of science enabled the activities of “a cabal, a secret political clique or faction.” His main goal in this book was to “explain their motive and objectives, which were political, not scientific . . . How . . . they bypassed and perverted the scientific method . . . [and how] They effectively silenced scientists who tried to perform the normal roles of critics and skeptics” (pp. 3–4).

Over thirteen chapters, the author describes the “Historical Development” (Chapter 1) of what he calls the “deliberate corruption of climate science” followed by, among other closely related topics, the “Transition from the Club of Rome to the United Nations” (Chapter 4), and “The Search for a Human Signal and Political Machinations Designed to Prove Human CO<sub>2</sub> was Causing Global Warming” (Chapter 5). A hefty Chapter 7 discusses in two parts what “Scientists Knew from the Start” and “What the IPCC Reports Say about the Computer Models.”

After claiming that “Nature Fails to Cooperate with the IPCC Deception” (Chapter 6), the author points out a sensible and pivotal issue in current

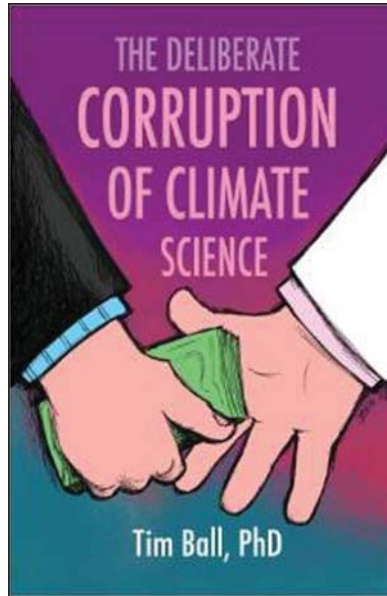


climate change debate: “Temperature Data and Data Manipulation” (Chapter 8). The remaining chapters of the book outline topics such as “Exploiting the Rich and the Poor under the Guise of Saving the Planet” (Chapter 9), “How the World Found Out What Was Going On in the IPCC Climate Science” (Chapter 10), a detailed presentation of the scandal known as Climate Gate, followed by “What Else Did We Learn From the Leaked Emails?” (Chapter 11). The last two chapters discuss “How Did So Few Achieve Such a Large Deception?” (Chapter 12) and “What’s Next?” (Chapter 13).

The overarching theme of the book—the corruption of climate science—is not something new or seldom heard about. A simple Internet search with the keywords “climate change skeptics” or “climate change deniers” reveals thousands of opinions and articles of various flavors and intensities. Dr. Ball focuses his arguments on “the deliberate corruption of climate science” exhibited in the leaked e-mails following the scandals dubbed “Climategate I” and “Climategate II.” And, despite a vigorous PR campaign by the Climate Research Unit (CRU) of the University of East Anglia UEA attempting to mend the broken confidence fences, the unbiased public had serious reason to believe that sometimes a supposedly neutral science may become tainted by political or other non-scientific agendas.

If scientists such as Dr. Ball, who are doubtful about anthropogenic global warming (AGW), are accused of lobbying for the fossil fuel industry, the proponents of AGW, according to this book, are dishonest brokers who maliciously use climate science “to advance the agenda of the progressive left.” The author continues his diatribes against proponents of AGW by quoting the former President of the Czech Republic, Václav Klaus:

I am afraid there are people who want to stop the economic growth, the rise in standard of living . . . and the ability of man to use the expanding wealth, science and technology for solving the actual pressing problems of mankind, especially of the developing countries. (p. 154–155)



Next, he accuses Maurice Strong, Al Gore, and the IPCC (Intergovernmental Panel on Climate Change) of machinations: “Instead of helping poor countries and poor people, [they] are reaping rewards of their activities while the people pay the price.” And further: “A vast industry has erupted in UK: Investing in climate change is proving to be profitable for governments, corporations, and investors from many sectors” (p. 155). On the next page, we learn that “Scientists of the IPCC may be involved in carbon trading, but they also benefit through being high-profile, easier access to funding, and easier promotion.”

Dr. Ball identifies several ways climate science has become corrupted. He starts with the fundamental definition of Climate Change as it was incorporated in Article 1 of the United Nations Framework Convention on Climate Change (UNFCCC) treaty formalized at the “Earth Summit” in Rio in 1992. “Climate Change” was defined as: “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over considerable time periods.”

It is obvious that this definition of climate change implies human intervention and makes human impact the primary focus of future climate research. Any proper scientific definition would list natural climate variability first, then the anthropogenic contribution. Following this tricky definition from 1992, Maurice Strong established for the newly formed (1998) IPCC two objectives: Create the science needed to prove anthropogenic CO<sub>2</sub> was the cause of climate change and then convince the public that if they didn’t act, the outcome would be catastrophic (p. 46).

Next, Dr. Ball reveals another corruption of climate science: When the IPCC finishes a report, it first produces a Summary for Policymakers (SPM) well ahead of publishing the Science Report. According to Dr. Ball, the SPM, which is the most important part of IPCC work, is always dramatically different from the Science Report. And the media and the public most likely read and refer only to the SPM, with only a few people reading the Science Report. According to one IPCC expert reviewer (David Wojick), “what is systematically omitted from the SPM are precisely the uncertainties and positive counterevidence that might negate the human interference theory. Instead of assessing these objections, the Summary confidently asserts just those findings that support its case. In short, this is advocacy, not assessment.”<sup>1</sup>

More disturbing, by releasing the Summary for Policymakers before the Science Report, IPCC leaders guarantee the pre-eminence of political message over science. They also require that the Science Report agree with

the Summary, when it should be the other way around. Using a phrase from the book, they “reach a conclusion and then make the research fit.”

Several scientists expressed serious concerns about the objectivity of publications released by the IPCC. They argue that many contributors to those publications cite themselves, a situation described by Dr. Ball as “typical of the incestuous political nature of the entire IPCC process.” When the National Academy of Sciences (NAS) appointed an Ad Hoc Committee in 2006 to report on the “Hockey Stick” Global Climate Reconstruction, its chairman, Professor Edward Wegman, made his first recommendation as follows:

Especially when massive amounts of public monies and human lives are at stake, academic work should have a more intense level of scrutiny and review. It is especially the case that the authors of policy-related documents like the IPCC report, *Climate Change 2001: The Scientific Basis*, should not be the same people as those that constructed the academic papers.<sup>2</sup>

The Wegman report ends with a strong conclusion:

Our findings from this analysis suggest that authors in the area of paleoclimate studies are closely connected and thus ‘independent studies’ may not be as independent as they may appear on the surface.<sup>3</sup>

Dr. Ball takes aim at the alleged lack of peer-reviewed papers published by opponents of AGW such as himself. He notes that apparently members of a group of 43 AGW proponents are peer-reviewing each other’s articles, and thus, “when there is a small group in a specialized research area, it is too easy to control what gets published. It is what I call peer-review censorship” (p. 81).

In a sub-chapter titled “Wikipedia—a Falsified Resource for Students and Media,” the author unveils a disturbing way of manipulating climate science by controlling climate information through Wikipedia. He accuses William M. Connolley (who established himself as an editor at Wikipedia) of, with the aid of cohorts and supporters, controlling all entries related to climate, climate change, and the people involved in climate studies. Allegedly, Connolley created or rewrote 5,420 separate Wikipedia articles.<sup>4</sup> When he disliked the content of an article, he removed it. For example, he removed all mention of the Climategate scandal from the article by Michael Mann, a friend and fellow proponent of the AGW. Lawrence Solomon, a Canadian writer on the environment, wrote about Connolley’s action as a Wikipedia editor:

When he disapproved of the argument that others were making, he often had them barred—over 2,000 Wikipedia contributors who ran afoul of him found themselves blocked from making further contributions. Acolytes whose writing conformed to Connolley's global warming views, in contrast, were rewarded with Wikipedia's blessings. In these ways, Connolley turned Wikipedia into the missionary wing of the global warming movement.<sup>5</sup>

A subtle and perverse way of corrupting climate science is discussed by Dr. Ball under the heading **Groupthink** (p. 227). Coined by social psychologist Irving Janis in 1972, groupthink enforces unanimity at the expense of quality decisions. The phenomenon occurs when a group makes faulty decisions because group pressures lead to a deterioration of mental efficiency, reality testing, and moral judgment. Groups affected by groupthink ignore alternatives and tend to take irrational actions that dehumanize other groups. A group is especially vulnerable to groupthink when its members are similar in background, when the group is insulated from outside opinions, and when there are no clear rules for decisionmaking.<sup>6</sup>

Dr. Ball believes the CRU/IPCC pattern (which emerged from Climategate scandals and other actions) may effectively illustrate this psychological phenomenon. In Chapter 11 he identified and described a number of symptoms of groupthink:

- **Having an illusion of invulnerability.** Contents of the emails display an arrogant invulnerability.
- **Rationalizing poor decisions.** Phil Jones, the former head of CRU at the University of East Anglia, tried to justify his decision to withhold Freedom of Information (FOI) material. His action was followed by other group members (Rob Wilson, Michael Mann, and Keith Briffa).
- **Sharing stereotypes that guide the decision.** This refers to unethical comments about practices happening inside the group without anyone challenging them. The reason? They all were making them.
- **Exercising direct pressure on others.** Putting pressure on some editors (e.g., at *Geophysical Research Letters*) to not publish certain papers the groupthink group did not like.
- **Maintaining an illusion of unanimity.** Self-explanatory.
- **Using mindguards to protect the group from negative information.** One of the group members, Gavin Schmidt, set up a blog, "RealClimate," to act as a "mindguard." He wrote in an email: "The idea is that we working climate scientists should have a place where we can mount a rapid response to supposedly

‘bombshell’ papers that are doing the rounds and give more context to climate-related stories or events.”

- **Examining few alternatives.** The original definition of climate change narrowed the options to only those pertaining to human activities. Similarly, out of all greenhouse gases, only CO<sub>2</sub> was singled out.
- **Not being critical of each other’s ideas.** As shown above, by peer-reviewing each other’s papers, the groupthink members were rewarding themselves with publication recommendations. At the same time, the “intruders” (aka skeptics) were kept outside the publication mainstream.
- **Not examining early alternatives.** The episode of the Medieval Warm Period was used in the first IPCC Report, but later one groupthink member (Michael Mann) decided to remove it because it contradicted his own model of global warming.
- **Not seeking expert opinion.** It is notorious now that the infamous “hockey stick” proposed by Mann, Bradley, and Hughes (1998) was flawed on statistical grounds. Had they asked for a statistician’s expert opinion, they would have avoided personal embarrassment and misleading the public until their “hockey stick” model was thrown in the trash bin.
- **Being highly selective in gathering information.** This point relates to cherry-picking the data to prove the group ideas.
- **Not having contingency plans.** The CRU/IPCC groupthink did not think that their emails would ever be exposed. It was a severe blow for them. It is not surprising that even the friendly journal *Nature* published the critiques of five climate experts under the suggestive title “IPCC: Cherish it, tweak it or scrap it?”<sup>7</sup>

Overall, *The Deliberate Corruption of Climate Change* represents an informative lecture for those who want to become more knowledgeable about the battle between the proponents and opponents of anthropogenic global warming. The book would have benefited from a Table of Contents and an Index—both would allow for quicker searches through the book.

### Notes

<sup>1</sup> The UN IPCC’s Artful Bias—Glaring Omissions, False Confidence, and Misleading Statistics in the Summary for Policymakers.

[http://www.john-daly.com/guests/un\\_ipcc.htm](http://www.john-daly.com/guests/un_ipcc.htm)

<sup>2</sup> <http://www.uoguelph.ca/~rmckitri/research/WegmanReport.pdf>

<sup>3</sup> Ibid.

<sup>4</sup> [http://www.conservapedia.com/William\\_M.\\_Connolley](http://www.conservapedia.com/William_M._Connolley)

<sup>5</sup> Ibid.

<sup>6</sup> [http://www.psyr.org/about/pubs\\_resources/groupthink%20overview.htm](http://www.psyr.org/about/pubs_resources/groupthink%20overview.htm)

<sup>7</sup> *Nature*, 463, 730–732 (11 February 2010). doi:10.1038/463730a

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## BOOK REVIEW

**First Sight: ESP and Parapsychology in Everyday Life** by James C. Carpenter. Rowman & Littlefield Publishers, 2012. 487 pp. \$49.95 (hardcover). ISBN 978-1442213906.

In *First Sight* Jim Carpenter presents a model and a set of theoretical ideas about psi. The model offers a new understanding of what psi is. It proposes that psi is carried out continuously and almost entirely unconsciously. According to Carpenter, “Everyone swims in an extrasensory sea, but accesses it and responds to it differently depending on unconscious intention.” A board-certified clinical psychologist with more than 40 years of active experience as a psychotherapist, educator, and researcher, Carpenter’s involvement in parapsychology began in the mid-1960s when he became associated with the Duke Parapsychology Laboratory.

After conducting extensive research in parapsychology from the perspective of a clinical psychologist, it’s not surprising that Carpenter believes that “parapsychology belongs to general psychology.” Unfortunately, most contemporary psychologists don’t share that perspective. But I believe that Carpenter’s elucidation of psi’s functioning in terms of long-established psychological constructs, such as cognitive and dynamic psychology, will not only further demystify the mechanisms of psi, but build a traversable bridge to conventional psychological thinking.

Carpenter makes the point very early in this book, however, that it’s not his intention to debate the reality or validity of psi. Rather, he operates on a proposition similar to other well-respected psi researchers such as Dean Radin. Their position is that the evidence for psi phenomena is sufficiently established, and that psi research today is less concerned with experiments that prove psi than with questions such as: What influences psi performance? and How does it work?

First Sight theory sets out to do exactly that. Carpenter undertakes the challenge in 25 chapters spread over 6 sections. One key point he makes in the first section is that his theory can normalize psi by showing how it runs smoothly along with other mental functions such as memory, perception, motivation, and creativity. He also establishes some basic premises such as “organisms are psychologically unbounded,” and “unconscious intention is the primary guide that is used by unconscious thought in constructing experience and action.” In this initial section Carpenter also elaborates on the

First Sight model by providing a list of 12 corollaries in which he employs familiar psychological thinking to better understand psi functioning. For instance, his Integration Corollary suggests that psi—along with other preconscious processes such as motives, values, and subliminal sensory information—contribute to the formation of experience.

Similarly, his Weighing and Signing corollary draws upon concepts used by cognitive theorists. He explains how the unconscious mind “weighs” the information that is picked up, then “signs” it as either negative or positive. Based upon that determination, it either elects to include or exclude that information in developing experience or action.

In the Intentional Corollary, Carpenter employs notions analogous to what cognitive psychologists refer to as “priming.” Here it is with regard to how the unconscious mind will utilize implicit psi material that it registers. He suggests the unconscious mind will either assimilate it or dis-assimilate it (i.e. either engage in positive or negative priming).

Section II further develops his ideas, reiterating early on that his First Sight theory is a psychological model, not a physical or neurobiological one. Scattered through the chapters in this section, Carpenter provides additional premises that underlie his theory. One is that “the mind thinks unconsciously as well as consciously,” and predicated upon that premise, he adopts a kind of “psychological determinism” (i.e. that experiences and behaviors are caused by unconscious processes).

Also within this section, he explores psi and consciousness, stating that “consciousness begins unconsciously.” Carpenter emphasizes that it’s a misnomer to use the term “subliminal perception” to explain how unconscious impressions work their way to conscious experience, because, he says, “truly subliminal perceptions are not conscious,” so it is not accurate to speak of them as perceptions at all. Rather, he prefers to use a term first offered by Alfred Whitehead North: prehensions.

Prehensions “get hold of things,” he states, and “unconscious prehensions get hold of things unconsciously.” Later, employing this preferred term, Carpenter integrates it into a fuller picture of how the mind employs psi information, saying, “At the leading edge of perception, psi prehensions arouse an anticipational nexus of meanings” contributing to a “preparatory process that helps the mind make the best use of its sensory experience.”

Lastly, in this section, Carpenter lists some precursors to his model. He acknowledges how Freud’s theories of the dynamic unconscious and psychological determinism inform his theory. He integrates certain Jungian concepts, including the idea that the primary function of the psyche is to create consciousness and meaning. Contributions of psychical pioneer



Frederick Myers are incorporated, particularly those that relate psi and the subliminal unconscious. And he draws upon the empirical research of J. B. Rhine, Gertrude Schmeidler, and the closely related theory of Rex Stanford known as Psi Mediated Instrumental Response (PMIR).

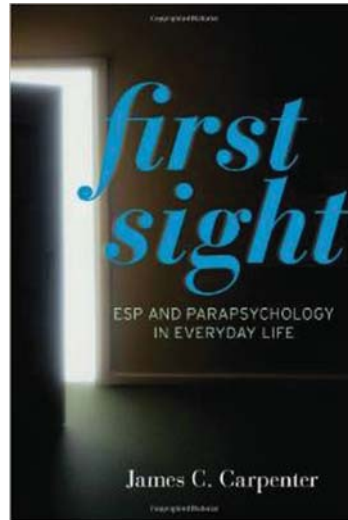
With regard to PMIR, however, Carpenter distinguishes his model from Stanford's. Where Stanford suggests that we occasionally access psi-mediated input only when it is instrumental to serving our needs, Carpenter believes that this process goes on continuously, that we select or deselect psi information in making decisions and carrying out actions.

In Section III, Carpenter digs in even further to substantiate his theory, and it becomes all the more evident at this point in the book that this is no light laymen reading. It's dense and comprehensive—and it needs to be. His model is complex and requires thorough theoretical substantiation and empirical support. He provides it in painstaking detail.

Acknowledging the extent of those details, (particularly those provided in Sections III and IV), Carpenter gives readers permission to skim the “Nitty Gritty” if they don't wish to explore them quite to the extent that they are offered. For those less interested in research design and interpretation, he suggests one can still follow the central ideas by reading the beginning and ending of each chapter. But I personally think it would be a mistake to not thoroughly peruse what he has compiled, because it is in those finer points that we gain a fuller appreciation for the workings of his model.

The First Sight model gets fleshed out in his detailed examination of unconscious processes, memory, creativity, fear, and extraversion. All are examined in light of his theory. This not only provides increased understanding of their effects on psi, but is evidence of just how deeply Carpenter has dug to assure a solid foundation for his model's explanatory value.

In this regard, a major foundational premise of his theory is that psi functions in an extended universe that goes beyond our physical boundaries of time and space. Therefore, it is important to cite and explain the details of research that provide the empirical evidence for that claim. Also, while he states in one of his earlier corollaries that an individual's unconscious



intention is critical in explaining why certain psi impressions get registered, at this point in the book he delves into it further.

For example, he details research outcomes that result in psi-missing. Psi-missing occurs when in a controlled parapsychological experiment, a given subject generates better than chance results in the opposite direction of that which is overtly intended. First Sight theory explains this as evidence of the effect of an individual's unconscious biased intentions. The individual isn't oblivious to the available extrasensory information, but registers it and avoids expressing it to a significant extent in the opposite direction. This is one of many excellent examples where Carpenter states, "The First Sight model accounts for a great many findings involving ESP and memory and makes them understandable in a common set of terms."

In the last two sections of the book, Carpenter explains how psi may manifest in everyday life. He suggests that when many people are first confronted with what may be the evidence of ESP, their "common sense becomes offended." He elaborates about how fear of psi can lead to its being prematurely designated as a form of psychopathology. This is of significant importance to me, because when I function in my role as a clinician, it is a challenge to discriminate between what may be a legitimate paranormal experience, one alleged to be paranormal but is actually a symptom of pathology, and certain cases where there can be a co-mingling of both.

By reading this book, conventional clinicians who are occasionally faced with such a unique presenting problem in psychotherapy can now be better prepared for that challenge. Carpenter's use of familiar psychological concepts not only helps the uninformed clinician understand how psi functions, but alerts them to the type of client who may be most inclined to present such anomalies. He also elucidates how psi may manifest in the consulting room, speaks to the qualities of therapists who may be most likely to perceive it, and even addresses therapist characteristics that may facilitate its expression.

In addition to providing information that can be helpful to unwitting professionals in the consulting room, these later chapters also provide some interesting examples of how psi works in certain gifted individuals. Their stories further normalize psi, and, as the subheading of the book indicates, shows how ESP and parapsychology manifest in the lives of everyday people. However, I was a little confused by a couple of points Carpenter raises in this regard. One that he reiterates a few times is that, "Psi is not an ability," and the other is, "Psi is not a trait."

His position is that psi not only belongs to everyone, but is going on within all of us all of the time whether we are aware of it or not. At the same time, toward the end of the book, he describes those individuals who clearly

have raised their awareness to what he calls the “inadvertent indications of psi phenomena.” He notes the gifted remote viewer Joe McMoneagle as one example.

McMoneagle has a great deal of natural talent, but I know that he also diligently worked to further develop that skill. In light of this, I struggled to reconcile Carpenter’s points.

As I tossed this conundrum around in my head, I sought a parallel analogy. I tried to think of one that might relate to how psi can be both available to everyone, and how some people may be better able to employ and improve its functioning. The analogy I came up with is our relationship to feelings.

We all have feelings. They come with being human. However, my personal experience and years of working as a clinician have shown me that we are not necessarily always aware of our feelings. Some of them may be unfamiliar, others easily identified and expressed, and some can remain largely unconscious. I have had a number of clients who have been significantly unaware of most of their feelings, and in some cases even deny having them. And sadly, I’ve worked with some people who are completely emotionally shut down.

Like the occasional inadvertent manifestations of psi, many of these emotionally out of touch individuals might be surprised by a random eruption of sadness, fear, or anger. But depending on their level of comfort with emotions (or what they may believe about them), they may distance themselves from some feelings, seeing them as having no place in their day-to-day experience.

Much of my work as a clinical psychologist is helping people understand their feelings. I assist them in becoming more aware when they are having feelings; teach them to gain comfort with actually experiencing them; learn to trust modulating their expression; employ them as a form of guidance; and how to empathically acknowledge and compassionately respond to the feelings of others.

Like this process of expanding our emotional consciousness, I believe psi can also be brought into consciousness. And I know from personal correspondence that Carpenter shares this belief. As a part of all of our overall evolution of consciousness, it is my contention that we can come to better understand the workings of psi, normalize its functioning, and become conscious of it in our everyday lives. First Sight theory helps put a definable handle on this particular aspect of our consciousness.

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## BOOK REVIEW

**The Outer Limits of Reason: What Science, Mathematics, and Logic Cannot Tell Us** by Noson S. Yanofsky. Cambridge, MA: MIT Press, 2013. 424 pp. \$29.95. ISBN 978-0262019354.

Humans seem to be driven by a desire to understand the world they live in, what we call “reality.” Jacques Monod, Nobel Laureate and co-discoverer of the gene, considered this desire to be genetic in origin. Perhaps it is the result of neurological development that favored cohesion among groups of hominids that shared a common desire for “understanding.” The neuropaleontologist Harry J. Jerison argued that reality itself is a mental construct and that living organisms create their own realities that provide them with just enough information to survive. Indeed, he suggested that the various senses of living organisms sent just enough information to their brains so that they could survive and that additional information was not sent, lest it actually contribute negatively to survival. For example, the frog’s eye only sent the frog’s brain a target for its tongue if that target was in motion. A stationary insect was not ignored, it literally wasn’t there.

Professor Noson S. Yanofsky, in his most fascinating and eminently readable treatise *The Outer Limits of Reason*, tells the story of how humans have developed the faculties and tools of reason with which to describe and understand their reality. Unfortunately for those readers who seek comfort in a belief that these tools and faculties will suffice to bring us complete understanding, Yanofsky reaches a somewhat depressing conclusion. Fortunately, the journey to that conclusion is exciting and thoroughly enjoyable. For Yanofsky, as powerful as these tools of logic, abstract mathematics, physics, and computation are, they are fraught with ambiguities, paradoxes, and ill-defined concepts that hinder their ability to bring understanding. Moreover, what we have already learned about the physical world (our reality) by using these tools indicates that it is a strange place indeed. Quantum mechanics tells us that there is a separation between the observer and the observed (“wholeness”), which leads to a vast array of conundrums. In the quantum mechanical description of things, knowledge of certain pairs of descriptive variables cannot be obtained simultaneously with equal degrees of exactness. Such knowledge is called “complementary,” meaning one or the other is to be used depending on the circumstances. In the more familiar “classical” reality, knowledge might be

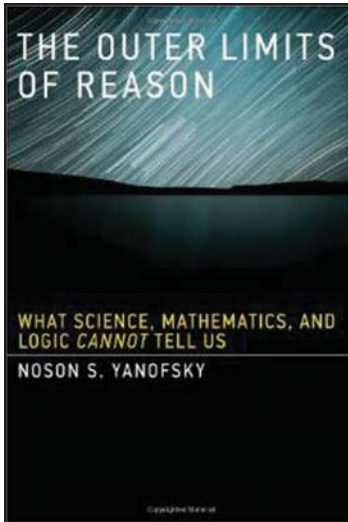
called “supplementary,” meaning that each new determination adds to what is already known.

Furthermore, and even more disturbing, is the fact that the very act of observation creates that which is observed, so that one cannot legitimately even talk about a system’s measurable characteristics during periods when it is unobserved. Not even Einstein could subscribe to that notion, yet Einstein was apparently wrong. In short, such characteristic variables were not endowed with values (no “hidden variables”) prior to their observation. Indeed, Niels Bohr often suggested that quantum mechanics was not a theory of nature, it was a theory of language, what one could say about nature. Perhaps this is our own version of the frog’s eye.

Yanofsky also provides us with a brief but complete discussion of Einstein’s theory of special relativity. According to this theory, the lengths of moving objects shrink (length contraction) and the elapsed time registered by moving clocks grows larger (time dilation). Moreover, this is no illusion. This is the nature of reality. To Einstein, this was an indication that the much-beloved concepts of length and time duration had no place in a reality in which motion was commonplace. We had come to accept the absolute nature of length and time only because we moved at a snail’s pace.

Yanofsky also does a capable job (and a much-needed one) of discussing Thomas Kuhn’s seminal book of 1962, *The Structure of Scientific Revolutions*. Although Yanofsky calls this book a treatise in the philosophy of science, Kuhn considered himself a historian of science and would probably have claimed to be motivated by setting straight the historical context of scientific progress. Kuhn describes science as consisting of long periods of normalcy, where new knowledge was systematically acquired according to an existing “paradigm” that defined what tools and methods were acceptable and could be used when adding to existing knowledge, which were infrequently punctuated by anomalies that could not be understood in the current paradigm. When such intractable anomalies arose, a paradigm shift occurred, during which new knowledge was not added incrementally, but instead all pre-existing knowledge underwent a radical shift. Kuhn’s thesis is still relevant (and frequently misunderstood and misapplied), so Yanofsky performs a valuable service in discussing it.

One of the many beauties of Yanofsky’s book is its admirable completeness. That which Yanofsky states, he proves. He does not tell the reader where to find the necessary explanatory material, he provides it. Even the most arcane mathematical assertions, such as Godel’s incompleteness theorem, are proven using the language of logic and abstract mathematics. The reader will be challenged to follow chains of reasoning that are pared down to the limits set forth by Einstein: “as simple as possible, but no



simpler!” The reader is warned that knowledge of the language of abstract mathematics is useful here, although not absolutely necessary.

Yanofsky also deals with philosophical conundrums (what he calls “metascientific-perplexities”), such as Eugene Wigner’s question of why mathematics seems so unreasonably capable of framing a description of the natural world. And, indeed, why has the intelligent life required the development of mathematics to come into being in the natural world? Yanofsky does not shy away from these and other teasers that have left great minds following seemingly aimless paths.

He distills these enigmas into three questions:

- 1: Why is there any structure at all in the universe?
- 2: Why is the structure that exists capable of sustaining life?
- 3: Why did this life-sustaining structure generate a creature with enough intelligence to understand the structure?

Yanofsky puts forth several possible “answers” to these questions, ranging from the religious and the mystical to those which generate new types of physical theories (many universes). I believe Yanofsky is at his best when taking us through these answers. He is a fine writer with a sensitivity for all points of view and he does not dismiss any of the various suggestions that have been made. One of Yanofsky’s answers involves a deeper discussion of a concept that is dear to my own heart, the concept of “symmetry.” In Western thought, symmetry is often associated with beauty, as can be seen in the art of ancient Greece. In Eastern thought, it is often slight deviations from symmetry that are regarded as beautiful, e.g., the “beauty mark.” The mathematician Emmy Noether proved that there is a connection between symmetry and certain properties of the physical world, called “conservation laws.” Today the artistic connection between symmetry and beauty (as felt by Einstein and Wigner) and the scientific connection between symmetry and conservation laws as shown by Emmy Noether is a dominant aspect of modern physics. Yanofsky does a particularly impressive job with this topic.

Yanofsky's tenth and final chapter is entitled "Beyond Reason." It signals the end of a journey that has been informative and enjoyable. Here, he sums up the various paradoxes of logic and mathematics that can lead the unwary down dangerous roads. He warns us not to abandon reason simply because its language is strewn with pitfalls. Although some may say that to go beyond the limits of reason requires that we switch over to approaches based on imagination and intuition, Yanofsky argues that reason is still the best method for improving humanity's lot in life and should not be abandoned heedlessly. Fortunately, we appear to have an ingrained sense of "beauty, wonder, ethics, and values" that is already "unreasonable" and, perhaps, "irrational," so we should let these guide us as we apply the admittedly imperfect tools of reason. Read the book and judge for yourself.

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## BOOK REVIEW

**Landscapes of the Mind: The Faces of Reality** by Lawrence LeShan. Guilford, CT: Eirini Press, 2012. 216 pp. \$15.00. ISBN 978-0979998980.

This book is a study of what may be called “worldview-making.” I use the gerund here because no one’s worldview is static. Our picture of the world is constantly changing because our context of experience is constantly changing. The way we experience the world and each other depends on our assumptions at a given moment of how the world looks, feels, and works. To understand any given individual, cultural event, or epoch of history, we need to take into account the operative myths, attitudes, and worldviews, which are bound to have deep and hidden roots.

LeShan dedicates his book to Giambattista Vico as his forerunner and inspiration, an eighteenth-century philosopher and founding father of the human sciences. Once we see the key role of our “world pictures,” as LeShan does, it becomes clear that each of us lives in a world conditioned by the dominant reality-pictures whose spell we labor under at any given time.

An educated person today out for a summer stroll suddenly hears a blast of thunder, and thinks, “Damn, forgot my umbrella.” Vico reminds us that the same blast of thunder heard by a person in a pre-scientific, pre-rational culture is heard as the voice of a god and fills the one who hears it with sacred terror. Vico understood, as I am sure LeShan would agree, that worldviews mediated by mythic imagination generate totally different kinds of experiences than worldviews mediated by modern science. In general, the scope and quality of our experience is always mediated by a particular worldview. This seems to me the vital (and challenging) premise of this book.

LeShan begins with a chapter entitled, “You and Your World Pictures,” and takes us through the various experiences of a kind of Everyman he calls “John Psmith,” a “consulting engineer.” He shows us Psmith in changing situations and explains how the different situations evoke different world pictures and their corresponding values, attitudes, and emotions. While on the job in his world as engineer, Psmith is cool and analytic; but when he learns that his daughter may be in mortal danger he’s prostrated by fear, drops the analytic façade, and switches into a mode of prayer. “This is a far cry from how Psmith perceived the world and reacted to it during his day at the office,” LeShan remarks.

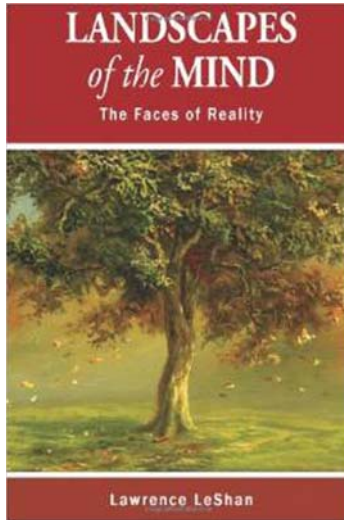


Later, after realizing the danger wasn't real, he finds himself dancing with his wife (where his picture of things regains a rosy hue, and later still, he retires and has a beautiful dream, thus encountering yet another reality with still other working assumptions and reality-defining properties. The author sketches a few more pairs of world pictures, i.e. ways of constructing reality, for example, between people during peacetime and people at war, and between childhood and adulthood. In short, the fate of every person is to continually go through different phases of life in different contexts and situations, all of which force us to adopt, more or less skillfully, different personas and styles of existential response. Life for LeShan appears then rather like an improvisational art form; some of us negotiate the twists and turns more gracefully and effectively than others. This may have something to do with the degree of elasticity with which we wear our worldviews.

To explore this new art form more effectively, LeShan suggests we need to model ourselves after Linnaeus and get serious about devising a taxonomy of worldviews. LeShan's sketch is fourfold, based on two sets of contrasting ideas: quantitative and non-quantitative; discrete and continuous. We have a world picture that is 1) quantitative and full of discrete particulars—call it unvarnished workaday materialism; 2) its polar opposite, non-quantitative and continuous—i.e. spiritual and unbounded, which is to say, mystical; 3) non-quantitative and discrete—which our taxonomist marks as defining the world of fairytales and mythology; and lastly, 4) the quantitative and continuous, cosmic physicalism, i.e. relativity theory—in general, the worldview of the modern physicist.

In this outline, we can see the debt to Vico who, in a different vein, related different ways of constructing reality to a tri-phase developmental model. It begins with the age of the gods, which is based on mute signs of creative power in which spiritual imagination is king; this (I would say) corresponds to LeShan's mystical mode of world picture, the continuous non-quantitative. Next for Vico is the age of heroes, still ruled by the power of myth and imagination, but in the realm of reason, which tames but does not destroy the mythic imagination; this corresponds to LeShan's world of fairytales and mythology, and brings danger, as suggested in his discussion of terrorism; and, finally, we come to a stage of development in which reason occupies a central place under the aegis of a kind of civic rationalism. Ideally, rationalism and mythology cohabit during this stage of the developmental model.

But for Vico there is a final stage of possible cultural evolution. This is the point where rationality overpowers the mythical and the mystical; when this happens, we are witnessing the dawn of cultural death, and Vico calls this fatal juncture the "barbarism of reflection." At this point, reason



becomes the servant of *malizia* (malice and self-interest), the *sensus communis* breaks down and people oppress each other and finally turn to civil war. This might be the capitalistic rationalism of LeShan's quantitative and discrete (ego-driven) worldview, where dog-eat-dog is the reigning ethic, compassion and imagination are dead, and the mechanization of life tends toward mutual annihilation.

In terms of LeShan's taxonomy of worldviews, we can see what the two dangers are; fortunately, LeShan has a plausible plan for recovery. The first of the two dangers is the terrorism of the simplistic mythical imagination, the worldview that justifies the massacre of innocents and the apocalyptic destruction of the other. This is a recurrent temptation that afflicts those who have been trampled on and humiliated by alien powers.

The second danger comes from within our own malice-ridden rationalism, a system in which small dehumanized cabals manipulate rules, laws, finances, and rhetoric to consolidate and increase their power, with indifference to the many. Not by overt violence but by cunning and deception they achieve their ends; in the end sapping the strength of the body politic. Because these agents of corrupt rationality are devoid of social responsibility (*sensus communis*) and are without empathy, compassion, or imagination, they can only alienate humanity and must in the end self-destruct. Amid the ruins, the stage is set for a new age of the gods, and the poetic rebirth of a culture or civilization.

It can therefore be argued that some pictures of reality harbor the seeds of their own destruction. But it is possible to devise strategies for transforming the trajectory of worldviews consumed by apocalyptic vendetta or the barbarism of reflection. LeShan rightly emphasizes the grip a certain worldview may have on people, but he also understands that human beings can resist the spell of their own beliefs.

"World pictures are tools," he writes, "each adapted to specific types of problems and needs and using different methods" (p. 60). But "new refinements" are sometimes introduced as a culture evolves. The danger—and this is the challenge posed to readers of this book—is that we become uncritically absorbed in a world picture and allow ourselves to become *its*

tool. “The trouble is we have a basic commitment to the idea that there is one true valid concept of reality (ours, of course) and that all others are primitive, childlike, mythological, or pathological” (p. 61).

The practical upshot of all this is that as students of the varieties of human experience *and* as flawed human beings trying to get along with other flawed human beings, we need to do everything in our power to break free from the conceits that keep us trapped in a blinkered cultural narcissism. Vico wrote that he labored hard and long to enter the mentalities of those who at first seemed alien, primitive, and savage; but he argues that it can be done by exploring the “modifications” of our own minds. The tool here that needs to be cultivated—historical imagination—is discussed at length by Isaiah Berlin in a book that LeShan cites.<sup>1</sup>

It is the rare philosopher or psychologist these days who takes the power of imagination as a crucial starting point. LeShan’s contribution in this book is precisely to do this. For scholars and scientists interested in engaging paranormal and mystical realities, *fantasia* (imagination), although underrated by rationalists, is the primary instrument. For anybody in any situation facing human difference and opposition, and for the student of comparative worldviews and worldview-making, the poetic faculty of emptying oneself and entering imaginatively into the interior world of the other is the first step toward a new model of enlightenment. Such is the message of wisdom I take from Lawrence LeShan’s probing *Landscapes of the Mind*.

**MICHAEL GROSSO**

#### **Note**

<sup>1</sup> Berlin, I. (1976). *Vico and Herder: Two Studies in the History of Ideas*. New York: Vintage Books.

## BOOK REVIEW

**Modern Miracles: Sathya Sai Baba: The Story of a Modern Day Prophet** by Erlendur Haraldsson. Guildford, UK: White Crow Books, 2013. 390 pp. \$19.99. ISBN 978-1908733252, eBook 978-1908733269.

This is a revised edition of a book first published in 1987, and most of the material is the same as in the first edition. It comprises a short account of personal interviews with Sathya Sai Baba by the author and various colleagues, as well as extensive interviews with people who were devotees of and close to Sai Baba during the 1940s and 1950s, when his miracles were most prominent. Most of the material is probably beyond most Westerners' boggle-threshold, which makes an evaluation of it rather tricky.

Haraldsson, in his summing-up, clearly considers that the vast majority of the reported materializations for which Sai Baba is most famed are probably genuine. However, he met the man and the interviewees, and therefore probably has greater trust in what they have to say than will the reader who has not met Sai Baba or the interviewees, and maybe has never been to India and so has no idea of the norms of belief within that culture. While I have a measure of sympathy with Haraldsson's conclusions, I suspect that most Western academics would not.

Sathya Sai Baba was born Ratnakaram Sathyanarayana Raju into a low-caste family in 1929 in a remote village some 200 miles from Bangalore in South India. Like most villagers at that time, he had only a rudimentary education and left school after his crisis in 1943, when he was 14 years old. This crisis was ostensibly caused by a bite from a scorpion, which left him unconscious for several hours, and is typical of a shamanic crisis experience. When he recovered he was no longer an ordinary village boy, but claimed to be the reincarnation of a previous south Indian saint known as Shirdi Sai Baba. Hence his name of Sathya Sai Baba. He would frequently fall into trance during the next two decades, so often that he was taken to see a doctor. Some people might see this as a form of possession, especially since those close to him often described him as two very different people—the partially educated village boy who was “very human,” and the divine saint who could do miracles with a flick of his wrist. It took decades for the local villagers to accept Sai Baba as a guru.

His most impressive miracles occurred during the decade or so after this transformation, while he was still young and, as described by the

interviewees, playful. After the crowds started to amass during his 30s he still performed miracles, but they were his common garden-variety manifestations, of which there must have been an estimated 500,000 over his lifetime. He died at age 81, so for 67 years he manifested things on average 20 times a day. Haraldsson checked with various local goldsmiths in an attempt to find whether or not any of them had made any items for Sai Baba, and found no one who would admit to doing such a thing. If anyone had personally created all these objects, they would be strikingly wealthy by now!

Haraldsson visited Sai Baba several times, the first in 1975 with the late Karlis Osis. They had a personal interview with Sai Baba in which he manifested a ring for Osis and a double rudraksha (special sort of holy nut) for Haraldsson. Neither Osis nor Haraldsson are skilled magicians and they detected no signs of fraud. This was the case whenever Haraldsson visited. On a second occasion when they visited, the enamel picture of Sai Baba within Karlis Osis' ring disappeared as a result of their skeptical questioning of Sai Baba. Haraldsson mentions this a few times as he considers that this would be very difficult to do as some form of trick. However, Sai Baba refused to take part in any experiments, and no other parapsychologists from the West attempted to work experimentally with Sai Baba, so no definitive study was ever done.

In 1976, when Sai Baba was 47 years old, extremely famous, and no longer performing some of his most impressive miracles, an Indian committee was set up by Bangalore University to perform an investigation. They wrote several times to Sai Baba requesting an interview, but received no reply. When they went to visit the ashram, having given prior notification of their visit, they were not permitted to enter. And thus ended the only formal investigation. The committee did, however, subsequently receive about 1,000 letters, which Haraldsson was never able to examine despite several attempts to get access to them.

As he was unable to do any experiments, Haraldsson decided to interview as many people who were close to Sai Baba as he could. Michael Thalbourne and Joop Hootkooper were the colleagues who assisted Haraldsson in obtaining these interviews. During the 1940s to 1950s there were about 200 to 300 devotees. Haraldsson states that he interviewed "a large number" of people who had been devotees of Sai Baba at this time, and presents interviews from more than a dozen of these people: a scientist at the Bangalore Institute of Science, the sister of Dr. C. T. K. Chari, a pharmaceutical manufacturer, a building entrepreneur, a local Raja and his brother, two classical singers, a Westerner (the son of the famous artist Nicholas Roerich), and the wife, sons, and daughter of a businessman. These

sons were teenage boys at the time who lived and slept in the same room as Sai Baba, dressing him and being with him most of the day. They report that at no time did they see him doing anything fraudulent. They also report a bewildering array of miracles. And “miracle” is the appropriate word for the things that he did. Haraldsson likens them to the miracles of Jesus Christ and more recent Christian saints. The manifestations reported by most of the above interviewees ranged from the most common, *vibhuti*, which is ash from sacred fires and incense, all the way to the feeding of large numbers of people from pots that were known to be washed, clean, and empty. Along the way we have him picking leaves off a tree and giving the person a fruit they had requested, often fruit that was out of season, or telling someone to go and pick some fruit from a nearby (non-fruit bearing) tree; rings, amulets, locketts, and necklaces manifested with a flick of the wrist; gold statues of various sizes were pulled out of the sand by the nearby river; the creation of a sheet of stamps with his face on them occurred; rain stopped in a specific area; various scents occurred; clairvoyance, precognition, and telepathy were expressed; things disappeared; water turned into petrol; his weight altered; he appeared at distant places; his robe changed color; *vibhuti* appeared from his forehead, mouth or feet; sacred objects appeared from his mouth; and so on and on and on, for every day of his life.

Less common but still fairly frequent were healings, such as a purported tonsillectomy (though the tonsils were not actually removed), none of which were properly documented or verified by doctors or hospitals. Haraldsson’s one attempt at verification with doctors and a hospital resulted in a very different story from that reported by the devotee. And there were many reported cases in which healing did not happen even though Sai Baba had promised it, and times when he refused to help.

Also reported were distant phenomena, most commonly that of *vibhuti* appearing on photographs of Sai Baba that people had in their houses or shrine rooms around the world. For some people, this *vibhuti* appeared constantly over a number of years. Other distant phenomena were when Sai Baba appeared to know what had happened to a person, either in life or in a dream. There were some phenomena about which Sai Baba seemed to have knowledge and others, such as *vibhuti* appearing on photographs, about which he knew nothing. There are also a few reports of him appearing to people in a distant place many hundreds of miles away, one of which involved several people and which has been carefully tabulated with regard to what was seen and heard by whom. The most often-reported instance of disappearing and then reappearing at another place was when he was walking with people to the river, and he would disappear from their midst only to reappear a few seconds later on a nearby hill. On a few occasions

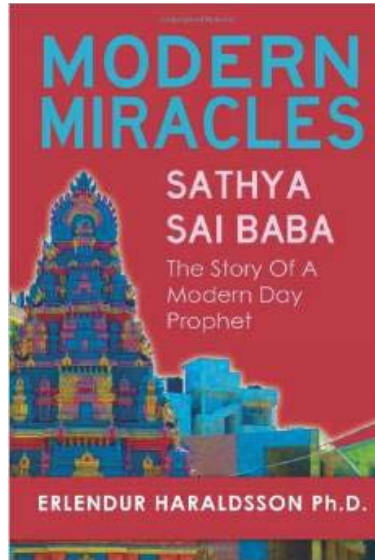
in the 1940s he did this and then manifested as a strong blinding light on that hill. Haraldsson interviewed ten witnesses to these manifestations.

There are two accounts of interviews with people who are no longer devotees, and once again there are many reports of miracles. Their reasons for no longer following Sai Baba were personal ones, rather than fraud. Haraldsson also mentions the time when Sai Baba was televised manifesting a gold necklace while at a presentation. This produced quite a stir in India, with newspapers claiming that Sai Baba had been found to cheat. Haraldsson examined the tape and did not find any evidence of fraud, but the quality of the tape is such that no final verdict can be given.

These interviews go on and on, reporting these phenomena again and again. Reading all the different interviews becomes rather repetitive because it's just one manifestation after another. Sometimes the reports are of the same occasions but reported by different people at that location, so there are different viewpoints of what occurred. Some of these are high-status people, e.g., a raja or university scientist, whom Haraldsson obviously considers will engender a higher degree of trust in the accuracy of their report. There is one interviewee who kept a diary at the time and permitted Haraldsson to use the information recorded at the time of the occurrence. Most of the memories essentially corroborated each other, but there were several minor discrepancies, as one would expect from memories that were 20 or more years old at the time that Haraldsson and his colleagues collected them.

After recounting all the interviews, Haraldsson reports on a questionnaire he gave to 29 people in 1983. Haraldsson then condenses the reports of the manifestations and other miracles, such as the fact that of all the people who had seen *vibhuti* produced more than 50 times, 25 of them saw manifestations of lockets and sweets more than 50 times, half the people reported seeing Baba change an object such as a leaf into something else, etc.

Haraldsson finally considers some of the theories that have been put forward to try and explain some of the lesser miracles, such as the production of *vibhuti* by palming pellets of ash, manifesting objects that were hidden



in his hair, secret pockets in his robe, and the use of accomplices, and finds that none of them can explain all that has been witnessed and reported.

All in all it is a remarkable account of a modern saint who purportedly had miraculous powers similar to those reported of Jesus Christ, and of the same order as those reported of some more recent Christian saints. It is therefore a real shame that Sai Baba would not assist in experimental procedures, as that might have given the world some phenomenal information concerning the further reaches of human experience and abilities. However, having done research myself in India, I am aware that many people there consider science to be a force that denigrates spirituality, and Sai Baba considered his miracles to be merely in the service of the spiritual message of “love all, serve all,” and he performed his miracles in order to show people that there is more to this world than our normal lives.

Because many of Haraldsson’s interviewees commented on the lack of any report of Sai Baba’s spiritual message in the earlier edition of the book, Haraldsson has included some information on Sai Baba’s teachings, and in particular has mentioned the good works that Sai Baba did as a result of the many donations he has received. Four colleges giving education up to the Ph.D. level to 2,000 students have been founded, and four hospitals have been built with the money, so that students and patients can receive free education and medical treatment. A huge water supply system has been built to provide clean water to 740 villages in the local area. This is very much in the tradition of a spiritual teacher who continues to live a simple life devoting all his time to good works, looking after and giving interviews to his devotees. All money received is usually spent on others.

There is insufficient information about his teachings for me to say at what level he taught, but the interviewees seemed perfectly satisfied with his level of wisdom and particularly with his gift of singing sacred songs. Therefore, in this respect, as a spiritual leader Sai Baba acted in a normal manner. The only unusual aspect was his ability to do miracles. This was frowned upon by other spiritual teachers in India at the time because it is considered damaging to your ego if you do such things unnecessarily. There are also reports of Sai Baba behaving in a manner that was abusive to others—definitely not the behavior of a true spiritual leader. He was an inconsistent person; sometimes the village boy and sometimes semi-divine.

Sai Baba is a controversial figure and Haraldsson is to be commended for taking so much time and trouble to get some measure of assessment of his miracles. Many people in India did not consider him a guru (teacher), but rather a fakir (Miracle man). This is not considered to be as holy. A saint is one who is humble, does not show off, lives an intensely spiritual life, spending most of the time in one sort of practice or another, and who



has noticeably attained some level of compassion and wisdom. While Haraldsson does briefly mention Sai Baba's spiritual teachings and simple lifestyle, these are not the things that most people associate with him or that stand out as being the most important aspects of his life. His teachings, according to Haraldsson, were basically "love all, serve all," which are good teachings, but relatively unremarkable. And while he lived the traditional life of a holy man, as a village boy he did rather well for himself, being fed, clothed, housed, driven around, and in fact having every aspect of his personal life looked after by his devotees, who were essentially his servants.

All in all, this book is a classic, a unique documentation of an Indian Miracle worker from the viewpoint of a Western academic. This is a quality book about Sai Baba, who, whether you consider his miracles to be real or not, was a truly remarkable man.

**SERENA RONEY-DOUGAL**

## BOOK REVIEW

**Psychology's Ghosts: The Crisis in the Profession and the Way Back** by Jerome Kagan. New Haven, CT: Yale University Press, 2012. 416 pp. \$35.00. ISBN 978-0300178685.

*Psychology's Ghosts*—an intriguing title; Jerome Kagan—an esteemed psychologist. This combination promised a book well worth reading; my expectations were high.

But my first impression was not good and I came close to giving up on it. The author bounces around from topic to topic, causing the book to read like a transcript of free associations, seemingly a product of whatever came into Kagan's mind no matter how tangential to the topic at hand. For example, one paragraph in the first chapter reads:

The distinctive emotional profiles of disadvantaged and advantaged adults affect how they socialize their children. This may be the most robust fact discovered by social scientists. Readers who broke a leg or suffered from the pain of shingles for several months will remember their helplessness and compromised sense of agency. Many adults trapped in poverty and possessing no special skills feel impotent to alter their unhappy condition.

My head was left spinning.

But I read on and came to appreciate that, however poorly written (or poorly edited) it was, this book does address important issues. If you can tolerate an author who jumps around from historical opinion (“the Japanese attacked the United States in 1941 because they regarded themselves as a superior race . . .”) to cultural comment (“after 1950 many American parents became excessively concerned with perfecting their child's sense of self”); from neurobiology (“depressives who inherit the long allele of the serotonin transporter also improve more on drug therapy than depressed patients with the short allele”) to broad generalizations (“humans cannot resist inventing goals they believe they should attain”), then reading this book may be worth the effort.

Kagan challenges four broad, underlying, and unfounded assumptions on which psychologists are inclined to conduct their research and build their theories. He calls these assumptions “Psychology's Ghosts.” They've all been talked about, written about, and complained about for years, even

decades, but Kagan takes his own, at times well-aimed, personal swing at them.

First, he attacks the myopic style of investigators who generalize their theories from lab studies and observation without considering the context, brushing away considerations of gender, age, ethnicity, social class, etc.

Too many papers assume that a result found with 40 white undergraduates at a Midwestern university responding to instructions appearing on a computer screen in a small, windowless room would be affirmed if participants were 50-year-old South Africans administered the same procedure by a neighbor in a larger room in a familiar church in Capetown.

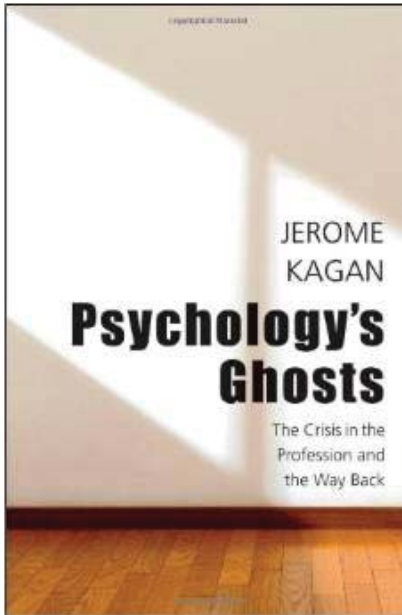
Then he focuses on “happiness,” an “in vogue” topic in this era of Positive Psychology, in which concepts such as *resilience* and *survivor* have replaced the previous trauma/victim mentality. Kagan examines happiness carefully, raising some serious cautions. He examines how, from individual reports of contentment to national surveys of social well-being, the meaning of the term *happiness* varies individually and culturally as well as historically. After demonstrating the pitfalls and concluding that these overall measures are “elusive” (read “useless”), he looks at alternative strategies involving the assessment of a person’s feelings in context and at a particular point in time. Finding these also wanting, Kagan concludes that

if equivalent judgments of well-being have different origins and meanings, are minimally related to sensory pleasures or daily moods, and are influenced by the informant’s age and culture, it is reasonable to be skeptical of the popular beliefs that the average well-being level in a society has any important implications . . .”

If happiness is “a psychological state whose definition remains fuzzy,” then even more fuzzy are the myriad mental illnesses that continue to be invented, diagnosed, and treated.

American psychiatrists and psychologists are exporting to the world a conception of mental illness that exaggerates the power of genes and drug cures and regards every bout of intense sadness or worry, no matter what their origin, as a possible sign of mental disorder.

This is not a new view; for more than 50 years, writers have identified the medicalizing, pathologizing activities of the psychiatric and psychological professions.<sup>1</sup> What Kagan contributes to the discussion is an abundance of examples drawing on cross-cultural data and the questioning of the scientific method and ethical premises. After pointing out the



now-common knowledge that the illnesses listed in the *Diagnostic and Statistical Manual of Mental Disorders* are arrived at by a process closer to politics than to science, he challenges inherent western values by noting, for example, that “male suicide is considered a heroic act in Japan” and “gambling is an adaptive trait in Brazil.”

Once diagnosed/labeled, most individuals are treated with one or more of a plethora of non-specific drugs that can be, as Kagan puts it, “likened to a blow on the head,” altering “neuronal activity in many sites to create abnormal brain states that often reduce the severity of a primary symptom.” While many recent books have countered the

current widely held reliance on the biological understanding of human feelings and behavior and the popularity of psychopharmacological treatments, few contemporary authors go on to challenge the almost universal belief in the effectiveness of psychotherapy.

Kagan does. He challenges not only the obviously “flakey” and questionable varieties but also raises questions about the “evidence-based” therapy du jour: Cognitive Behavior Therapy (CBT). Countering the popular claims that CBT is scientifically proven to be effective, he refers to some of the current research that tends to get brushed aside, citing in detail a study involving depressed patients that found “an initial improvement followed by frequent relapses” similar to those found with drug treatments.

Had the book ended on these challenges it would have been a stronger book. But instead, perhaps because Kagan wants so much for the profession to finally start paying attention to these pervasive, fundamental flaws and somehow miraculously transform, he goes on for another ninety pages. This final segment of the book, titled “Promising Reforms,” is supposed to “provide the constructive suggestions that might catalyze change.” But, in my reading (and rereading) of these pages, I was filled more with despair than hope.

Echoing his earlier thoughts about “context,” he urges researchers (and clinicians) to keep their eyes open for “patterns” of diverse evidence rather

than to settle for single factors that confirm existing theories. He calls for “patience” (his term), claiming that factors such as the “publish-or-perish” imperative put too much pressure on researchers to produce popular, mainstream results rather than to allow the time for “discoveries that require the persistent pursuit of less popular but potentially fruitful ideas.” Pointing out the confusion around the meaning of words and terms, he encourages less reliance on verbal, self-report measures. And finally, he admonishes “psychologists to remain sensitive to the ethical premises that penetrate their research and affect the advice they give to clients.”

Such sagacity from a man who rose to prominence through his own solid research in the 1960s may well reflect his concern about the “crisis in the profession.” But, as the book’s subtitle expresses, Kagan’s solution is to find “the way back.” The problem is that it is the way forward that those who are rising to influential positions within the profession today have their sights set on. Therefore it is likely that instead of reflecting on his message, they’ll go with the flow.

#### Note

<sup>1</sup> See, for example, Thomas Szasz, *The Myth of Mental Illness: Foundations of a Theory of Personal Conduct*, Delta, 1961.

**TANA DINEEN**

## BOOK REVIEW

### **Light Changes: Experiences in the Presence of Transforming Light**

by Annekatrin Puhle. Guildford, United Kingdom: White Crow Press, 2013. 276 pp. \$17.99. ISBN 978-1908733184.

Author Annekatrin Puhle is a philosopher, health consultant, and psychical researcher in the area of exceptional human experiences. This book is an extensive review of light experiences that have been reported throughout history. In particular, the book focuses on light experiences in which the light described appeared to have a healing potential and a transcendent capacity.

The author has undertaken extensive research into amassing and analyzing a multitude of experiences from many different sources. There is an extensive collection of more than 800 examples gleaned from the literature as well as 51 self-selected, word-of-mouth reports collected by the author. All previously reported cases are taken from what the author considers to be classic and potentially classic texts in the field of psychical research and related fields, as well as from three major journals: the *Journal of the Society for Psychical Research*, *PSI Researcher*, and *Paranormal Review*.

The book begins with an historical consideration of light experiences throughout the ages in scriptures and ancient texts and in folklore, myths, and cultural beliefs. Light experiences have been described in a variety of contexts such as life-threatening events, crisis, depression, as well as featuring prominently in ancient texts. Such experiences have long-lasting, profound, and life-transforming effects on those who report them.

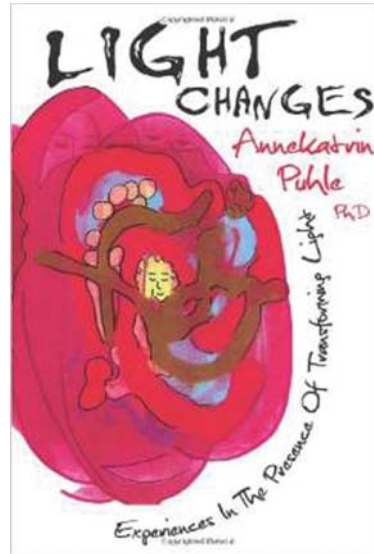
The main body of examples has been categorized according to various factors such as the type of form the light took, the types of situations and contexts in which the light was experienced, the state of mind of the experiencer, as well as the content and interpretation of the experience. Examples cited are from varying scenarios including light experienced during a near-death event, a deathbed vision, at funerals, during an emotional crisis, meditation, lucid dreaming, hypnagogic/hypnopompic states, and even while wide awake.

There is an interesting analysis that considers the frequency of the various aspects reported and the context and state of mind of the experiencers at the time. The analysis is careful and thorough and rather than focusing

on what causes these experiences, the focus is refreshingly on the fact that these experiences do occur, so what is the meaning of them? How can we make sense of these experiences?

The author raises some important points. These light experiences are highly significant and meaningful to those who report them and they raise more questions than they answer. During these experiences, people have attained wise and guiding insights that have a lasting influence in their lives. Furthermore, if the general public remains uneducated about the depths of these experiences, then many people will fail to report them, leading to less material for further research. These are life-enriching experiences that should not be perceived as embarrassing, but rather should be embraced and encouragement given to the experiencers to share them.

This interesting book contains many fascinating examples of light experiences by different people and under different circumstances. It is a wonderful resource for general readers as well as for students of psychical research and religious and spiritual experience. Much hard work has gone into preparing the descriptions, history, and extensive analysis. It is a valuable asset to anyone who is about to embark on their own research in this area and is a valuable addition to the literature.



**PENNY SARTORI**

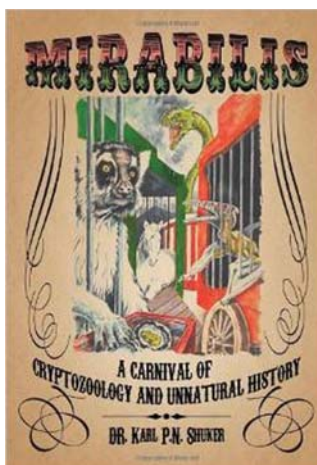
## FURTHER BOOK OF NOTE

**Mirabilis—A Carnival of Cryptozoology and Unnatural History**  
by Karl P. N. Shuker. San Antonio, Texas, and Charlottesville, Virginia:  
Anomalist Books, 2013. 185 pp. \$15.95 (paperback), \$9.95 (Kindle).  
ISBN 978-1938398056.

Karl Shuker is a highly reliable guide to all things cryptozoological, as well as a highly prolific author (of more than 20 books!) and blogger about all manner of anomalies (The Eclectarium of Doctor Shuker, <http://www.eclectariumshuker.blogspot.com/>), cryptozoology in particular (ShukerNature, <http://karlshuker.blogspot.com>). *Mirabilis* illustrates Shuker's talent for readable discussion and the analysis of recondite material unlikely to be familiar even to dedicated anomalists and cryptozoologists.

I learned quite a bit from this volume: that the size of insects is limited physiologically by their need for oxygen (in the absence of a cardiovascular system), that things that look like spiders (solifugids) may not be spiders, and much else. Chapter headings include such tantalizing things as *Megalopedus*, *Sukotyro*, and *Tygomelia*. Several pieces illustrate all-too-common newspaper hoaxes, prevalent particularly in the 19<sup>th</sup> century. A timely warning about the digital age is given in connection with alleged sightings of huge spiders. The perpetual enigma of entombed life is tackled in Chapter 9, "Toads in rocks . . ."

This is a perfect book to have lying around to dip into whenever you feel the need to learn of something different, intriguing, informative, or instructive.



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**The 10th Annual European Conference of the  
Society for Scientific Exploration**

November 13–15, 2014, Leiden, The Netherlands

**DATE AND PLACE WILL MOVE**

**Program Chair:** C. M. Chantarel Toporow, [cmc.toporow@mac.com](mailto:cmc.toporow@mac.com)

**Local Arrangements Coordinator:** Erik Schultes, [schultes@hedgehogresearch.info](mailto:schultes@hedgehogresearch.info)

**Meeting Venue:** Leiden University Medical Center. All sessions will be held here.

**Parking:** The SSE has arranged a special rate for overnight self-parking at the LUMC garage, Albinusdreef 2, 2333 ZA Leiden. The organization will have a parking ticket available at the registration desk on site. You can park your car first and then leave the parking garage by using that specific ticket. For information and route description, go to:

<http://www.lumc.nl/0000/12299/71127110446221/?setlanguage=English&setcountry=en>

**Hotel:** Hotel Ibis, Stationsplein 240, 2312 AR LEIDEN, email [H8087-RE@accor.com](mailto:H8087-RE@accor.com) Telephone: 071 – 516 00 00. A large block of rooms has been reserved for the SSE at a special conference rate of € 84.00 including breakfast. Excl. € 2.00 tourist tax p/p night (€ 97.00 for a double room). Reservations must be made by 18 October 2014 to receive this rate. Please call directly to the hotel or send an email and mention this reference number—BOER121114—to reserve your rooms at the special rate. Hotel Ibis is a basic hotel within walking distance to both the Leiden University Medical Center where the conference will be held, and to the city center and all the museums. The Hotel has a nice lobby with a bar.

**Transportation:** There is a good direct train connection (20 minutes) between Schiphol Airport (Amsterdam) and Leiden Railway Station. For information about the arrival hall floor plan: [www.schiphol.com](http://www.schiphol.com)

To & from Schiphol Airport and for the train schedule, go to [www.ns.nl](http://www.ns.nl) (English)

**Registration:** Please go to the following website to register:

[https://www.boerhaavenascholing.nl/pages/Boerhaave/ShoppingCart?addactivity=30860&lang=en\\_uk](https://www.boerhaavenascholing.nl/pages/Boerhaave/ShoppingCart?addactivity=30860&lang=en_uk)

**Students:** The Society encourages the attendance of students and young investigators, and the conference is open to the public. There is a special, reduced registration fee for students at this event. Please encourage students from your area to come.

**Welcome Reception:** Wednesday, November 12th, starting at 6 p.m. at the hotel.

**Field Trip:** Leiden Boerhaave Science Museum, <http://www.museumboerhaave.nl/english/>

**Dinner:** The Dinner will be on November 14th at Koetshuis, in the Leiden city centre

<http://www.koetshuisdeburcht.nl/>

#### INVITED SPEAKERS:

Dr. Peter Taylor: Professor of Microbiology UCL School of Pharmacy & NIHR University College London Hospitals Biomedical Research Centre University College London

**Pelargonium—Native South African Plants Providing a Rich Source of Metabolites with Anti-Tuberculosis Properties**

Dr. Yolene Thomas: Director of Research, Pierre and Marie Curie Universite, Centre National de la Recherche Scientifique, & Associate Editor: *Water Journal*

**Commentary on Cellular & Molecular Language: A Role for Water?**

Dr. Eduard van Wijk: Faculty of Science, Leiden Academic Centre for Drug Research, Analytical BioSciences [title to be determined]

#### CALL FOR PAPERS — SUBMISSION DEADLINE: September 20, 2014

The overall theme of the conference is “Physical and Biological Correlates in Alternative Healing Modalities.” Invited speakers will help define themes to be developed further by our own SSE membership, and the program will include papers assessing progress and social/political issues in areas of longstanding interest to SSE members. All conference sessions will be held in the Leiden University Medical Center (LUMC).

**Theme 1: Life, Water, and Light**

**Theme 2: Physical and Biological Correlates to Alternative Healing Modalities**

**Theme 3: Our Universe: Exploring Concepts of Non-Localilty**

**Evening Panel:** November 13th

#### CONTRIBUTED PAPERS

Contributed Papers Contributed papers by full members on any topic of interest to the Society are welcome. Papers related to the themes of the conference will be grouped with relevant invited talks when possible. A poster session may be provided for selected papers or on request.

Titles and abstracts for contributed papers should be sent to the Program Chair: Dr. C. M. Chantal Toporow ([cmc.toporow@mac.com](mailto:cmc.toporow@mac.com)). Electronic submission is required. The Title should be short and informative. Include Author name, affiliation, and contact information. Abstracts should be 300–500 words (one page of single-spaced text), and should summarize the main points of the paper. Plain text as the body of the e-mail is preferred. If special formatting is required, submit a Word document. If selected for presentation, plan on a 15-minute talk with 5 minutes for questions. Submissions by Associate members must be sponsored by Full members.



# JOURNAL OF SCIENTIFIC EXPLORATION

A Publication of the Society for Scientific Exploration

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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.

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