Volume 23, Number 1  2009

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EDITORIAL

This issue of the *Journal* is my first as Editor-in-Chief. I’m pleased, but more than a little surprised, to find myself in this position. Only a few months ago, well into the process of veering erratically toward retirement, I imagined I’d spend the next several years doing little more than what senior philosophers often do: writing memoirs, musing about big and abstract ideas, flaunting my lack of practical wisdom by publishing incompetent but more accessible reflections on everyday concerns, or just becoming tragically curmudgeonly.

So much for my predictive (or precognitive) abilities. And as it happens (actually, as it so often happens), I’m glad I got it wrong. I very much welcome the opportunity now before me. In my view, the *JSE* plays a vital role in our intellectual ecology. We continue to need a respectable forum in which qualified members of the scientific and wider academic communities can address theoretical and empirical issues that more mainstream publications are—shamefully—reluctant to touch. It’s not just the complacency, smugness, and conceptual rigidity of many scientists and academics that highlights the need for a publication like this. It’s also the attitude of students who are often much more curious than their mentors and also more willing to question the received wisdom of their disciplines. I’d prefer to think that the inquisitiveness and open-mindedness I find in my students marks a generational change, something that will eventually alter the overall intellectual climate and allow a journal like the *JSE* to become more mainstream (or perhaps even to render its existence totally unnecessary). But I recognize how improbable that scenario really is. It’s more likely that much of this curiosity and enthusiasm will be suppressed or snuffed out, at least temporarily, in the cutthroat process of pursuing advanced degrees. For those students wanting to acquire top-notch academic credentials, a resolute (or even just declared) interest in scientific anomalies and unfashionable theories can quickly be a professional kiss of death.

Still, it can be striking to observe the conceptual gulf between students and their mentors. A few years ago I tried to give an invited lecture to my university’s physics department about the evidence for psychokinesis and related philosophical topics (e.g., the nature of replicability and the concept of explanation) that I know these colleagues hadn’t considered carefully. I was virtually shouted down by angry members of the physics faculty before I had gotten 10 minutes into my talk. The display I witnessed was one I’ve seen many times: scholars speaking, ostensibly authoritatively and derisively, about matters that they clearly knew only superficially, and whose ignorance could easily be exposed. (However, I should add that one member of the physics faculty, a renowned expert from China in nonlinear and quantum optics and laser physics, spoke up in my defense and cited studies done in his country on qigong.) Several graduate students approached me...
afterwards to express their surprise and dismay at the reception I had received. They wanted to know more, and they couldn’t understand why their teachers were expressing such intense anger and hostility over what seemed to them merely to be a matter of empirical and theoretical inquiry, and which in their minds deserved a more dispassionate appraisal.

Now if history is any guide (or unless I’m even more inductively challenged than I realize), before too long many of those students will have embraced the ignorant and condescending stance of their teachers. I realize that scholarly maturity too often leads to a loss of a sense of wonder over the remaining mysteries of nature. But the disparity I’ve often witnessed between students and their mentors isn’t simply that the latter have become stale intellectually. On the contrary, I believe it’s very revealing to respond, not simply with sarcasm, but with cries of outrage to a sympathetic and well-informed interest in an empirical anomaly, especially one to which genuinely serious research has obviously been devoted. That’s not merely the reaction of a tired soul. In my view, that behavior betrays something much more disturbing—an expression of a deep intellectual cowardice, typically expressed as a kind of arrogant posturing. As I’ve mentioned elsewhere (Braude, 1997), I used to believe naïvely that scientists and philosophers were committed to discovering the truth. And as if that weren’t naïve enough, I also believed that these ostensible truth-seekers would actually be pleased and perhaps even excited to learn they’d been mistaken, so long as that revelation brought them closer to their goal of getting at the truth. Although I long ago lost my innocence about that matter, I still cling to the belief that complete cynicism is unwarranted. And in fact, I’ve been fortunate to find a few professional societies—the Society for Scientific Exploration among them—that serve as a refuge for those who haven’t lost their curiosity and excitement about the unknown, and who are willing to think outside the box and challenge various areas of received wisdom.

I’ve often had the opportunity to let students and audiences know about the *JSE* and to recommend that they peruse its articles. Despite my cynicism regarding the academic community and its alleged devotion to free inquiry, I continue to believe that something from the *Journal’s* pages will rub off on at least some of the readers. I’m confident that they will admire the fair and careful-but-adventurous spirit of research to which the SSE is devoted and which the *JSE*’s articles reveal, and I hope that many will want to emulate it and will at least eventually join both the SSE and the ranks of *JSE* authors.

So I’m very pleased to find myself now in a position where I can more actively work on behalf of the *JSE* and both protect and promote the standard of inquiry that it exemplifies. It may alter the trajectory of my declining years and delay my succumbing to a life of sloth and the joys of rampaging disillusionment and pessimism. But I can live with that.

I’m delighted, then, but hardly surprised, that my first issue as Editor-in-Chief is so stimulating. Credit for that, however, must go to my predecessor, Peter Sturrock. I’ve simply been fortunate to inherit the fruits of his labors. In any case, readers will find the customary intriguing mix of topics in this issue.
One final matter: To what I imagine will be the relief of some, I don’t consider the editorial page of this journal as a forum for the regular expression of my views. I’ve had plenty of those opportunities already. However, I probably won’t shun them entirely in the future, if I feel it’s appropriate.

I should also mention one relatively minor editorial change I plan to enforce, and I encourage prospective authors to take note. Previous issues of the JSE have allowed some flexibility in the displaying of references and notes. Some papers embedded references into endnotes, whereas others confined references to a separate section following the endnotes. Henceforth, the JSE will adhere to that latter practice. I know and value the fact that the JSE is an interdisciplinary journal. But while journals in all fields typically have their own differing styles of formatting references, I don’t believe there are pervasive disciplinary differences in the way references and notes are displayed. However, every first-rate journal I’m familiar with has a consistent policy concerning the display of notes and references, and from now on, so will the JSE. References must be confined to their own section following endnotes, and papers not conforming to that practice but otherwise accepted for publication will remain unpublished until the author(s) makes the appropriate revisions.

Finally, let me add that I’m very grateful to my predecessors, Henry Bauer and Peter Sturrock, for their encouragement, counsel, and support as I take on the job of Editor-in-Chief. Peter has been especially generous with his time (and patience) in preparing me for this role. Thanks also to SSE President Garret Moddel for his unjustifiably flattering expressions of confidence as he tried to convince me to take on this job. I’m also fortunate to have a first-rate editorial staff to assist me as I learn the ropes. Assistant Managing Editor Kristen Jarboe has done some truly heroic hand-holding, and retired (but hardly forgotten) Managing Editor Joy Richmond and her worthy successor Eleanor Lohmann have also been a delight to work with. I very much look forward to our continued collaboration.

Reference

RESEARCH

A New Experimental Approach to Weight Change Experiments at the Moment of Death with a Review of Lewis E. Hollander’s Experiments on Sheep

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Abstract—A critical review is conducted based on analytical simulations of an experimental study to measure change in weight of sheep upon death published in 2001 by L. E. Hollander in JSE. The experimental system is modeled as a single-degree-of-freedom vibrating system. The following conclusions are obtained. (1) The experimental result obtained with Sheep #7 appears to be natural, as expected by the theoretical model. (2) Hollander’s conclusion that “there was a transient gain of weight of 780 grams” in the case of Sheep #7 is not an appropriate expression of the experimental result, because the 780 gf pulse includes an overshoot reaction of the system; however, the cause of the force event remains to be explained. Analytical simulation of a supposed weight measurement experiment involving an out-of-body experience (OBE) subject is carried out using the theoretical model under a supposed weight decrease of the experient. The simulation showed that the disturbance caused by breathing becomes the primary noise in the system response. However, some noise reduction techniques can be used to discern the change in the weight of the experient, if there indeed is a weight decrease. Weight measurement experiments using a trance channeler are suggested because “trance channeling” is objectively more observable than OBE.

Keywords: critical review—analytical simulation of experiment—transient weight gains—death of sheep—analytical model of vibration—overshoot reaction—disturbances due to cardiac and breathing activities—simulation of OBE—supposed weight decrease during OBE—suggested experiments with trance channeler

1. Introduction and Objectives

It has been a little over 100 years since the paper by Duncan MacDougall, MD, was published concerning an experimental study of the change in the weight of the human body in life-to-death transition [1]. Since then, there have been several skeptical as well as critical arguments against MacDougall’s paper, specifically those expressed in books by a psychologist (Susan Blackmore, 1982) [2] and a scientist (Len Fisher, 2004) [3]. Similar skeptical arguments are posted on many
Web sites. Most of these arguments are similar, stating how “his experiment was sloppy; his claimed weight of the soul turned out to be simply the result of sloppy science; his experiment was silly, you’d need not just a scale, but a completely isolated system.” From a scientific point of view, it can be shown with relative ease that none of these criticisms have a quantitative basis. For example, Len Fisher’s speculation [3] of “convection currents” of air to explain the missing 21 g requires an updraft ranging from 40 to 55 cm/s against the whole flat bottom area (assuming that it is in the range from 2 to 1 m², respectively) of MacDougall’s cot bed on the scale platform (this can be easily shown based on a stagnation-point flow model using the Bernoulli equation [4]). Inducing such an air velocity of a natural-convection updraft requires, for example, an array of heated vertical plates with a height of 1 ft covering the entire flat bottom area with a temperature that exceeds the ambient air temperature by more than 90°C (experimental data can be found in McAdams [5]), depending upon the shape and size of the heated plates. Contrary to this thermo-hydraulic reasoning, Fisher speculates that the convection currents may be induced by (not an increase, but) a “decrease” in the patient’s body temperature upon death. Indeed, it will be very difficult to scientifically refute the missing weights in MacDougall’s experiment, even though his experiment, conducted around 100 years ago, may appear sloppy from the viewpoint of today’s scientific standards.

Apparently, Lewis Hollander’s paper published in the Journal of Scientific Exploration [6] was stimulated by the 100-year-old MacDougall paper. Although the author writes that the study is very much preliminary, it is felt that a technical review of his experimental results is necessary, and this is the primary motivation for the present paper. In addition, in this paper, an analytical simulation of the probable responses of Hollander’s weighing system will be shown in a supposed weight measurement experiment of a subject during his/her out-of-body experiences (OBEs) to understand the difficulties, if any, in such experiments.

2. Trial Simulation of Hollander’s Experiment

2.1. Characteristic Parameters of Weighing System

One of the best ways to understand the experimental results is to carry out a simulation of the experiment by using a simple analytical model for the experimental weighing system. Although Hollander’s paper gives very little information on the experimental system, a mathematical model of vibration based on a single degree of freedom can be created for the weighing system using data available from the paper. The basic equation of the model of damped vibration for a mass “m” under an externally applied force can be expressed as follows (see standard text books on physics or vibration engineering, e.g., [7]):

\[ x'' + 2\sigma x' + \omega_n^2 x = F(t)/m, \]  

where
Simulations of Hollander’s Experiment and OBEs

\[ x = \text{small displacement (in meters) of the mass from its equilibrium position (} x = 0); \ x' \text{ and } x'' \text{ are the time derivatives of } x, \text{i.e., acceleration and velocity, respectively; the positive direction of “} x \text{” is defined here as vertically downward, along the direction of gravity; } \]

\[ \sigma = \text{vibration decay rate (1/s); } \]

\[ \omega_n(=k_{eq}/m)^{0.5} = \text{natural angular frequency of the system (rad/s); } \]

\[ k_{eq} = \text{equivalent spring constant of the system (N/m); } \]

\[ F(t) = \text{time (t) dependent external force applied to the system, expressed as } F_0 \times f(t) \text{ with dimensionless function } f(t) \text{ and normalization force factor } F_0 \text{ (N); } \]

\[ m = \text{mass (kg) of the system, which is supposed to be constant throughout the experiment. } \]

This mathematical model is intended to predict only the small vibration behavior of the mass with respect to its equilibrium position by an action of an external force applied to the system. The model is not intended to predict the change in the weight of the system. If there is a small change in the mass “m,” the effect may be expressed as an external force \( F(t) \) that simulates the removal or addition of the corresponding load. The assumption of constancy of mass “m” above is an approximation of the model; in other words, a small decrease (\( \Delta m \)) in “m” (due to the loss of moisture evaporating from the animal bodies, as reported in Hollander [6]), in comparison to the initial mass (\( m_0 \)), shall not considerably affect the vibration behavior of the weighing system. In the experiment, \( \Delta m \) was less than 0.1% of the initial mass, \( m_0 \). The experimental quantity “Weight in Kilograms” expressed in the ordinate of the figures in Hollander’s paper may be related to the “\( x(t) \)” of Equation 1 as follows:

\[ k_{eq} \times x(t) = \text{change in weight at time “} t \text{” from its equilibrium weight. } \]

The “Weight in Kilograms” expressed in the ordinate of, for example, Figure 2 of Hollander will be equated to “\( k_{eq} \times x(t) \)” + equilibrium weight of the system at time “t.” (Here, the term “equilibrium” indicates that the system is not in motion.) But this reasoning is scientifically wrong unless the mass of the system is not in motion at time “t.” Hence, the physical quantity “\( k_{eq} \times x(t) \)” will be denoted as a “system response,” which can still be compared with the experimental vibration behaviors shown in the figures in Hollander [6]. The characteristic parameters of system vibration will be estimated in the subsequent sections.

(1) Weight of system (\( M_p \)) without animal subject. Hollander reports that the system consists of a platform (size: 215 × 92 cm) on a steel frame, which is set on four load cells of 45-kg capacity each; hence, the maximum allowable load on the load cells will be 180 kg. According to the paper, “the full-scale capacity of the system was 100 kg, with a sensitivity of −5 gm”; from this, the total weight of the steel frame and platform without an experimental animal subject on the platform is assumed to be \( M_p = 80 \text{ kg (maximum). The total mass of the system} \)
“m” in Equation 1 becomes “$M_p + m_{sp}$” where $m_{sp}$ is the mass of the experimental animal subject on the platform. It was reported in the paper that “the measured response time of the system was 0.2 seconds,” which may be taken to indicate that any details of a force event occurring within 0.2 s will not be reliably recorded by the weighing system.

(2) Characteristic parameters of vibration of system. The natural angular frequency of the system ($\omega_n$) with experimental subject Sheep #7 ($m_{sp} = 70.2$ kg) on the platform will be estimated from the damped free vibration behavior of the system shown in Hollander’s Figure 2. The vibration pattern is shown in the figure with a period of about $T_d = 1.9$ s during the time period from about 56 to 71 s during transience, which gives the angular frequency of damped free vibration, $\omega_d(=2\pi/T_d) = 3.31$ rad/s.

This damped vibration behavior also gives the vibration decay rate “$\sigma$” of the system. The logarithmic decrease in the damped vibration, $\delta = \ln(x_{n-1}/x_n)$, will be estimated as 0.263 from the figure by fitting six to seven $x_n$ data points, where $x_n$’s are the peak amplitudes of successive damped vibrations from the equilibrium value. Using the relationships $\delta = \omega_n \times \zeta \times T_d$ and $\omega_d = \omega_n \times (1-\zeta^2)^{0.5}$, where $\zeta$ is the viscous damping factor, these parameters can be estimated to be

$$\omega_n = 3.31 \text{ (rad/s)},$$
$$\zeta = 0.042 \text{ (-)}, \text{ and}$$
$$\sigma = \omega_n \times \zeta = 0.138 \text{ (1/s)}.$$

$\omega_n$ is almost equal to $\omega_d$ because of the small $\zeta$ value. These parameters are specific to the case of the experiment with Sheep #7. The angular frequency, $\omega_n$, is related to the equivalent “spring constant” of the system as follows:

$$\omega_n^2 = k_{eq} / (M_p + m_{sp}) = (k_{eq} / M_p) / (1 + m_{sp} / M_p),$$

where

- $k_{eq}$ = equivalent spring constant of the system (N/m),
- $M_p$ = mass of the system as defined above (=80.0 kg),
- $m_{sp}$ = mass of the experimental subject (kg).

The equivalent spring constant is calculated as $k_{eq} = M_p \times \omega_n^2 \times (1 + m_{sp}/M_p) = 1.646 \times 10^3$ N/m. The natural angular frequency ($\omega_n$) of the system without an experimental subject on the platform and $\omega_n$ (with an experimental subject on the platform) are related to each other as follows:

$$\omega_o = (k_{eq} / M_p)^{0.5},$$
$$\omega_n = \omega_o / (1 + m_{sp} / M_p)^{0.5}.$$

Then $\omega_o$ becomes 4.54 rad/s.

Although these characteristic parameters ($k_{eq}$, $\sigma$, $\zeta$) of the natural vibration of the system have been estimated from the result of the case of Sheep #7, it
is assumed that these are also applicable to other experimental cases. These characteristic parameters of the weighing system can be and should be determined experimentally first by disturbing the system using an inert mass instead of placing a live animal on the platform. These parameters provide essential information when the experimental results are interpreted.

The linear differential Equation 1 can be solved numerically by using the Euler-Romberg method after expressing the equation in a non-dimensional form by introducing non-dimensional time “τ” \((τ ≡ t/T_o, T_o ≡ 2π/ω_0)\) and displacement “X” \((X ≡ x/x_o, x_o ≡ T_o^2 × F_o/m)\). A computer program (with double precision in FORTRAN 77 on a PC) for the numerical solution has been created for this study. The program has been validated by comparing its numerical solutions with the analytical solutions for several sample problems easily available in textbooks of physics or vibration engineering. In what follows, numerical simulations of several supposed problems are carried out to elucidate the significances of Hollander’s experiment.

2.2. Simulation of “Missing 21 Grams” with Weighing System

First, let us suppose that the first case of MacDougall’s experiment is conducted using Hollander’s system. According to MacDougall’s paper [1], the loss of 21 g on his platform scale was observed “in a few seconds” after the judgment of patient death. Here, let us suppose the following three simplified modes of weight decrease in “the few seconds”:

(a) instantaneous decrease,
(b) decrease in 1.5 s at constant rate, and
(c) decrease in 3 s at constant rate.

The initial weight of the patient is arbitrarily assumed to be 62.0 kg (which is the present author’s weight). The system is supposed to initially be at an equilibrium state without motion, which means that any disturbance caused by the live patient before death is neglected. The time of death is supposed to be 5 s into the transient for this calculation. \(F_o\) in Equation 1 becomes \(-0.2058\) N (which is \(-21\) gf) and \(f(t)\) is determined for each mode of the weight decrease history. The calculated system responses to the three modes of weight decrease are shown in Figure 1 as a function of time.

All three cases finally stabilize at a loss of 21 g in about 35 s since the start of the decrease. The system, however, responds differently depending upon the rate of decrease. The vibration of the weighing system (or “ringing” of the load cells) is largest in the case of an instantaneous decrease, in which case, of course, we do not say that there was a “transient weight loss” of 40 g initially in the transient. The large swing beyond 21 g is just an overshoot of the system responding to the fast loss of the small load. If the decrease occurs slowly, the overshoot will become small, as in the case of mode (c). Regardless of the mode of the weight decrease, the system settles in the same new equilibrium state with the system mass decreasing by 21 g from the initial state.
This parametric case has been chosen to show that Hollander’s writing of “weight gain transient of 780 grams for 4 seconds” in the case of Sheep #7 in his paper [6] is not an appropriate expression; the “weight gain transient” includes some overshoot vibration of the system! The mentioned “transient gain of 780 grams” in his Figure 2 apparently shows only a small undershoot of the system, and this might have led to Hollander’s expression. However, we can make a case with no undershoot and a case with small undershoot after a large single pulse, in which a square impulse of an external force is imposed on a system with time width $\Delta T = 2\pi/\omega_n = 1.897\ s$ and vibration decay rate $\sigma = 0.0$ and 0.138/s, respectively. These are considered to be parametric cases of simulation of Hollander’s experiment, as discussed in Sec. 2.3 with Sheep #7 with an initial weight of 70.2 kg.

Figure 2 shows the system responses with and without damping to the imposed square impulse. In the case without damping ($\sigma = 0$), the impulse of height $F_o$ (415.4 gf) with width $\Delta T = 2\pi/\omega_n$ gives a peak pulse height of 831 gf, which is exactly two times the impulse height $F_o$. This case has the analytical solution to the problem (with the start of impulse at $t = 0$), the peak amplitude of which after impulse ($t > \Delta T = 2\pi/\omega_n$) is proportional to $\sin(\omega_n\Delta T/2)$; hence, the amplitude becomes zero for $\Delta T = 2\pi/\omega_n$. During the impulse ($0 < t < \Delta T = 2\pi/\omega_n$), the analytical solution is given as $F_o \times (1 - \cos(\omega_n t))$; hence, the peak height becomes $2 \times F_0$ at $t = \Delta T/2 = \pi/\omega_n$. One may wonder why the mechanical work done by giving impulse to the system disappears after the impulse, $t > \Delta T = 2\pi/\omega_n$. Actually, the positive work (which is defined as $\int F_o dx$, with displacement “dx[t]” in the positive direction) performed by the impulse during

![Figure 1. System responses to three modes of 21 g decrease.](image-url)
Simulations of Hollander’s Experiment and OBEs

The first half of the impulse is canceled out by the negative work (due to displacement “dx[t]” in the negative direction, i.e., deceleration of motion) performed during the last half of the impulse, and the system settles in equilibrium of no motion at the end of the impulse. In the case with damped vibration ($\sigma = 0.138/s$), the peak height becomes 780 gf (with the intentionally specified impulse height $F_0 = 415.4$ gf). Because of damping (i.e., energy dissipation), the maximum height of the peak becomes less than $2 \times F_0$. The amplitude of the vibration after the impulse is relatively small because of the specified impulse width $\Delta T = 2\pi/\omega_0$. These system responses have nothing to do with “contradiction” to or “violation” of Newton’s third law of motion (as mentioned in [6]); they are the results of Newton’s three laws of motion.

Although these cases have been intentionally created, the results show an overshoot to 780 gf or more under the action of a square impulse of 415.4 gf (4.073 N) height. Hence, we cannot say that there was a “weight gain transient of 780 grams” in the case with Sheep #7 in Hollander’s experiment. The actual impulse height that caused the 780 gf might have been only 415 gf in the experiment, the cause of which is yet to be determined. It is not a “weight gain transient of 780 grams,” but a “force impulse giving a transient pulse of 780 gram-force” in the system response. Any change in weight can be concluded only when the weighing system has settled in an equilibrium state, although this is an idealized condition. Further, although the width of the 780 gf pulse is depicted as 4 s in Hollander’s Figure 2, it appears to be only about 2.6 s. Which of these values is correct? The question can similarly be posed for his Figure 3.

Fig. 2. System response to imposed square impulse with or without damping.
2.3. Simulation of Hollander’s Experiment for Interpretation of Results

Many questions can be raised about the experimental results reported in Hollander [6]. Some of them are as follows:

(a) Why did the typical vibration behavior recorded in the case with Sheep #7 (in his Figure 2), apart from its amplitude, not appear in the cases with Sheep #3 and #8 (in his Figures 1 and 3, respectively)? What caused the strange vibration pattern in the Sheep #8 case with 21 data points sampled per second as in the Sheep #7 case? Did the system function normally in the two cases with Sheep #3 and #8?

(b) What was the cause of the 780 gf peak pulse in the Sheep #7 case?

(c) Can we see any effects of breathing and cardiac activities on the system response in the case of Sheep #7?

These questions will be addressed in the following simulations.

2.3.1. Simulation of Case with Sheep #7

1. Events that affect weighing system. Any movement, whether visible externally or not, of the experimental subject on the platform will affect the weighing system. Breathing and cardiac activities as external forces acting on the system may be specified by the following parameters:

   (a) angular frequency, \( \omega_{\text{ext}} \), and
   (b) amplitude of disturbances.

   According to the paper [6], the cardiac frequency of the subjects changed transiently from a normal value of 70 to a rapid crisis value of 120 beats per minute, values that correspond to frequencies of \( f = 1.167 \) and 2.0 Hz, respectively. These frequencies correspond to an angular frequency \( \omega_c = 2\pi \times f \) of 7.3 and 12.5 rad/s, respectively, both of which are more than two times higher than the natural vibration frequency of the system, \( \omega_n = 3.31 \) rad/s. The paper provides no information on the breathing frequency of the subjects. According to biological data presented in a science handbook [8], the normal breathing frequency of sheep is in the range of 16 to 24 breaths per minute, which gives an angular frequency ranging from 1.7 to 2.5 rad/s. If the breathing frequency of Sheep #7 at crisis is assumed to be 30 breaths per minute, the angular frequency becomes \( \omega_b = 3.14 \) rad/s, which is very close to the natural frequency of the system. These angular frequencies of cardiac activity and breathing indicate that in the experiments, breathing activity might have affected the system response much more than cardiac activity.

   As regards the amplitudes (\( F_0 \)) of these disturbances as external force \( F_0 \times f(t) \), we do not have much information at hand. The amplitudes will be treated as parameters in the simulations. Hollander [6] writes in the “Discussion” of his paper that “The normal breathing appears as a rhythmic series of inertial weight gains followed by corresponding losses,” which may suggest that “the inertial
weight gains and losses” are due to air mass inhaled and exhaled by the lungs of sheep. If this is the intended meaning of the author, however, it is not correct, because the amplitude of vibrations (about 300 gf in the case of Sheep #7) is far greater than the effect of the change in air mass. The inhaled/exhaled mass of atmospheric air per “normal” breath of sheep never exceeds 1 g (it may be about 0.6 g at most based on the air volume per breath, as given in the science handbook [8]; see Table A1 in the Appendix). The disturbances in Hollander’s Figure 2 persisted up to the last breath of Sheep #7, and they might have been caused by body sway accompanied with breathing in crisis.

According to Hollander (Figure 2) (and others), there might have been a remarkable disturbance during the last breath of the subjects. This disturbance may be simulated with a triangular impulse with a width of 1 second at the bottom. The amplitude will be treated as a parameter. The last sporadic disturbance after the last breath of the subject will be simulated with a square impulse, as discussed in Sec. 2.2. It is assumed in the calculation that the weighing system is initially at equilibrium state without motion. The reported evaporation of moisture from the animal subject during the experiment is not included in the simulation; hence, the simulation is intended only to observe the vibration behavior of the weighing system with an experimental subject of constant weight on the platform.

The time step size for the numerical solution is constant, about 7 ms, although the Euler-Romberg algorithm automatically cuts down the size until a required convergence criterion is satisfied. The convergence criterion used for the change of solutions (for dimensionless displacement and velocity) in successive iterations is $10^{-7}$, which corresponds to a convergence in 0.01% for displacement ($x$) and in less than 0.01% for velocity ($x'$).

(2) Results of simulation. A simulation of the experiment with Sheep #7 is shown in Figure 3a and b. In the calculation, the cardiac vibration effect was modeled by using the vertical component ($F_y$) of the cardiac activity force (CAF) of humans reported in an experimental paper by Silvia Conforto et al. [9]. This application of human cardiac data is simply due to the lack of sheep data. The heart rate is assumed to be constant at 80 beats per minute and the heart is assumed to arbitrarily stop at 45 s (7 s after the last breath) into the transient. The breathing frequency is arbitrarily assumed to be constant at a crisis rate of 30 breaths per minute and it is assumed to stop at 38 s based on Hollander’s Figure 2. The external disturbance caused by breathing is expressed by $A_o \times \cos(\omega_b t)$, where $\omega_b$ is the angular frequency of breathing with amplitude $A_o$ ($=0.345$ N); this gives a vibration amplitude similar to that of the experiment. The disturbances assumed in the calculation at the last breath and after the stoppage of breathing will be explained in the calculated results.

Figure 3a shows the superposed external disturbance ($F_o \times f(t)$) assumed in the simulation with no disturbance after the square impulse. The high frequency disturbance caused by cardiac activity from the start to 38 s is modulated by the
lower frequency disturbance ($A_0 \times \cos(\omega_b t)$) caused by breathing. The triangular impulse from 37 to 38 s reaches a maximum value of 4.04 N at 38 s (also adjusted to give a vibration amplitude similar to that of the experiment); the cardiac disturbance is superposed on the triangular impulse. The bottom width (1 s) of the triangular impulse is specified based on the corresponding experimental sharp
Simulations of Hollander’s Experiment and OBEs

p

pulse recorded around the time of the last breath. The disturbance shown from
38 to 45 s corresponds to the cardiac disturbance (F_y) only, and it shows a
peak-to-peak swing of about 165 gf. The last square impulse has a width of 2π/ω_n
(=1.9 s), as defined in Sec. 2.2, and its height is adjusted to 4.3 N to give a peak
pulse height of 780 gf.

The calculated system response is shown in Figure 3b, which also shows the
superposed disturbance. The system response from t = 0 to t = 37 s (just before
the triangular impulse) is determined primarily by the breathing disturbance.

The effect of cardiac disturbance is minimal because of the large ratio of the
angular frequency of the cardiac disturbance (ω_c; more than 8.4 rad/s) to the
natural frequency of the system (ω_n = 3.31 rad/s). (About 6% of the 165 gf swing
will be transmitted to the system response, if only F_y disturbance is considered in
the simulation.) The theory of “vibration isolation” explains these behaviors
in terms of the “amplification factor for transmissibility,” H_b(ω_ext/ω_n, ζ), of
vibration, where ω_ext/ω_n and ζ are the ratio of angular frequency of the external
disturbance force to the natural one and the viscous damping factor of the system,
respectively (see Dimarogonas & Haddad [7]). H_b implies that the amplitude of
the external disturbance vibration (F_o) will be multiplied by the factor H_b in the
output amplitude of the system response. The frequency ratio for the breathing
disturbance, ω_b/ω_n, becomes 0.95, and that for cardiac disturbance, ω_ext/ω_n,
becomes more than 2.5 because of the higher frequency components included in
one cardiac cycle (according to Fourier analysis of F_y, 2ω_c, 3ω_c, 4ω_c, and 5ω_c
have larger weights than the fundamental harmonic ω_c calculated from the heart
rate). In breathing disturbance, H_b becomes 7.8 for ω_b/ω_n = 0.95 with ζ = 0.042,
while in cardiac disturbance, H_b = 0.19 for ω_c/ω_n = 2.5. For a higher harmonic
component of the cardiac disturbance, for example, 3ω_c/ω_n = 3 × 2.5 = 7.6,
H_b becomes only 0.02. Hence, H_b roughly indicates the calculated results of the
disturbance effects on the system response.

In Hollander (Figure 2), we can identify a higher frequency behavior during
the time from about 19 to 28 s; the frequency is about two times the natural fre-
quency of the system (2ω_n = 2 × 3.31 rad/s). This means that there was a dis-
turbance of corresponding frequency, to which the weighing system strongly re-
sponded, and this behavior may suggest that the weighing system has another
component of natural frequency of about 2 × ω_n (which comes much closer to the
cardiac frequency for 80 beats per minute than ω_n). This can be expected because
the weighing system is composed of a two-dimensional plate and frame. However,
this behavior cannot be simulated by the simplified single-degree-of-freedom
model. When compared with the experimental result presented in Hollander’s
Figure 2, the present calculated result (Figure 3b) shows quite a different damped
vibration after the triangular impulse at the last breath. The calculated damped
vibration after the last square impulse at about 50 s into the transient appears
similar to the experimental result. However, this is simply because of the artifi-
cially specified width of the impulse (ΔT = 2π/ω_n), as discussed in Sec. 2.2. If
the width is specified wider or narrower than this value, damped vibrations similar to those calculated after the last breath will appear. Thus, this computer model can simulate only some aspects of the experiment.

(3) Possible cause of last impulse. The time integral of the last square impulse, ∫F(t)dt, used in the calculation above gives a momentum of 8.16 N·s. However, half the ΔT with the same impulse height, that is, an impulse of 4.08 N·s is sufficient to give the 780 gf peak pulse, though the damped vibration after the impulse will be different. This can be seen from the analytical solution to the square impulse problem with no damping. If a free-fall event is assumed within the body of Sheep #7 after its apparent death to give this impulse, what would be the requirement with respect to a free fall?

Suppose that a mass “m” starts to fall freely through a vertical distance “h” in the gravitational field, and it stops delivering impact within the body when the distance is reached. The momentum of the mass at impact can be calculated as follows:

\[ m \times v = m \times gt = m \times (2gh)^{0.5}, \]

where \( v \) and \( g \) are the velocity at the impact and the gravitational constant (9.8 m/s²), respectively.

To give an impulse of 4.08 N·s, the mass “m” and falling height “h” must satisfy the following relationship:

\[ m \times v = m \times (2gh)^{0.5} = 4.08. \] (3)

If the distance is specified as \( h = 5 \) cm, the required minimum mass becomes \( m = 4.1 \) kg for an impulse of 4.08 N·s. This result may not be consistent with Hollander’s statement in his “Discussion” that “[experimentally] this requires a movement of several liters of fluid flowing relatively unobstructed to achieve a 50 to 100 gram transient pulse.” This inconsistency between the two arguments may be because of the assumed width of the impulse (ΔT) being \( \pi/\omega_n \), which gives a 780-gf peak pulse with a minimum impulse \( \int F(t)dt \) in the present speculation.

Could such a force event or its equivalent occur in the body of dead sheep? Could the ruminant system of sheep, which may contain fluidized food and possible gas accumulated in the process of fermentation of food, be responsible for such an event? Although this is just a speculation, we must seek out probable causes before concluding the experimental results as being “unexplained.”

2.3.2. Simulation of Other Cases?

Hollander’s paper shows the system responses for the cases with Sheep #3 and #8. Simulations of these cases with the present analytical model will provide no conclusions because the experimental results shown in his Figures 1 and 3 are quite different from the simulation result for Sheep #7. The weight of the experimental subject affects the simulated system response through the change in the
natural frequency of the system \( (\omega_n) \) and the term “\( F(t)/m \)” with different masses \( (m_{sp}) \) of the experimental subjects (see Equations 1 and 2). The \( \omega_n \)’s for Sheep #7 \( (m_{sp} = 70.2 \text{ kg}), \#3 (88.9 \text{ kg}), \) and \#8 (92.2 kg) are calculated to be 3.31, 3.12, and 3.09 rad/s, respectively, but the present model, with these effects of \( m_{sp} \) included, cannot give the peculiar vibration behaviors recorded in the cases with Sheep #3 and #8. Figures 1 and 3, if they experimentally present no problems, cannot be expected to be replicated by this simple theoretical model.

According to Hollander (Figure 1), the result with Sheep #3 is “a typical example of a transient occurring after the last deep breath and during a period of calm, free of any movement”; the result with Sheep #7 is rather exceptional. Regardless of the causes of the force impulses appearing in the experimental transients, that is, whether they are scientifically explainable or “unexplainable,” we should suppose that the system responds to the impulses based on physical laws. Because the apparent responses of the system are very much peculiar in the cases with Sheep #3 and #8, there will be doubts about whether the weighing system functioned normally in those cases, including the cases with Sheep #3 and #8'. Normal functioning of the weighing system can be confirmed by conducting a system response test between successive cases by imparting a test disturbance to the system using an inert mass on the platform. Hollander did not mention such a test in his paper.

Although Hollander concluded that “there was no permanent weight change at death” in every case of the experiment, no reasoning for the conclusion was given. Definitely, the reported large escape rate of moisture from the subject bodies obscured any small anomalous change, if any, of the weight of the subjects upon death.

3. Simulation of Supposed Weight Measurement Experiment during OBEs

MacDougall’s missing weights ranged from 10.6 to 70.8 (or 45.8) g [1]², and they have neither been refuted nor proved in the last 100 years. This may support the assumption that there is a psycho-physical interaction between the “non-physical human mind” and the “physical body,” and that part of the energy that accompanies the psycho-physical interaction and manifests in the physical dimension may be weighable in our gravitational field as a mass, \( \Delta M \), through Einstein’s equation, \( \Delta M = \Delta E/c^2 \), where \( \Delta E \) is the energy manifesting in the physical dimension. It should be noted here that when people talk about MacDougall’s missing weights, they refer only to “the missing weight in the few seconds,” which ranges from 10.6 to 42.5 (or 21.3) g [1], neglecting the additional decreases in weight that ensued in up to 18 minutes since the time of their judgment of death. (Hollander did so in his paper [6], for example.) The very additional missing weights are one of the “notorious points” against which the psychologist Blackmore stated her skepticism [2]. If one doubts the additional missing weights, the person should doubt the one observed in the few seconds too. However, unless
there is a definite refutation of MacDougall’s original results based on a scientifically quantitative basis, his experimental results should be respected. This is also because we do not know as yet the real meaning of “human death,” when we take into account research results on “human reincarnation,” for example, that by the late Prof. Ian Stevenson (1918–2007) [10].

MacDougall’s experimental results may encourage weight measurement experiments in transitions to and from altered states of consciousness to show that in the transitions, there may be a violation of the Law of Conservation of Energy, which has been one of the most cherished empirical principles of physics.

3.1. Conditions for Simulation

Weight measurement experiments using a system like the one used by Hollander, for a physical body of human that is supposed to be left behind during OBEs, will be affected by disturbances caused by cardiac activity and body sway accompanied with breathing. The objective of the simulation is to clarify technical difficulties, if any, in such experiments. To make the simulation simple, it is assumed that the OBE experient is lying supine on the platform of the weighing system to minimize possible body sway. Only disturbances caused by the cardiac activity and breathing of the experient are taken into account. Based on the results of psycho-physiological research on OBE experients, the heart and breathing rates during the supposed OBE are assumed to be normal rates expected in the state of relaxation, although there are exceptional cases [11]. The normal weight of the OBE experient \( \text{msp} \) is assumed to be 62.0 kg.

(1) Cardiac disturbance. According to the science handbook [8], the heart rate of a human adult at rest ranges from 64 to 70 beats per minute. Based on this, the lower value of the range is selected in the simulation: 64 beats per minute for the heart rate.

The cardiac disturbance in the OBE experient lying supine may be expressed by the \( F_x \) component of the CAF published by Conforto et al. [9]. This component is the “frontward-backward” cardiac force obtained from experimental subjects standing upright. However, the most predominant CAF is the vertical \( F_y \) (“upward-downward”) component in [9]; this component showed a peak-to-peak swing in the range of 1.3 to 3.0 N, depending on the experimental subjects. To maximize the possible cardiac disturbance in the simulation, \( F_y \) component with a peak-to-peak swing of 3.0 N is used (the \( F_y \) component used in Sec. 2.3 for the case with Sheep #7 is multiplied by 1.855 to get a peak-to-peak swing of 3.0 N). The time history of \( F_y \) in [9] is expressed as a function of the percent cardiac cycle. In the present simulation, \( F_y \) is given in the form of a table. The period of one cardiac cycle will be determined from the heart rate.

(2) Breathing disturbance. In the previous simulation of the case with Sheep #7, it has been shown that the breathing disturbance is dominant in the response of the weighing system. The situation will be different in the case of a human
OBE in a relaxed state, but as will be shown later, the disturbance caused by breathing will remain dominant in the system response.

Because there is no experimental data for breathing disturbance, a simple model is prepared for the following simulation study. The model, which is described in the Appendix, is intended to describe the up-down motion of the abdomen of a male subject in relation with the change in the air volume in the lungs during one breathing cycle. This up-down motion causes a cyclic force-impulse, \( \int F(t) dt \), to which the weighing system may respond. The model assumes \( F(t) \) to be square-shaped with height \( F_1 (> 0) \) and time width \( \Delta T \). The impulse \( -F_1 \times \Delta T \) (upward) and \( +F_1 \times \Delta T \) (downward) will be imposed on the system at the start of inhalation and at the turnaround to exhalation, respectively, in every breathing cycle. The time interval (\( T_{B1} \)) of inhalation is assumed to be one-third of a breathing period. The magnitude of \( F_1 \times \Delta T \) has been evaluated in Table A1 of the Appendix. The evaluation shows that the impulse ranges from 0.034 to 0.101 N·s, depending primarily on the inhaled/exhaled air volume per breath, period of breathing, and the body mass participating in the up-down motion. The breathing rate of a human adult at rest ranges from 10.1 to 13.1 breaths per minute [8].

The height of the square impulse \( F_1 \) depends on the duration \( \Delta T \), which may range from 0.1 to 0.5 s according to muscle dynamics. However, calculations with changing \( \Delta T \) have confirmed that the effect of breathing disturbance on the system response will be determined primarily by the magnitude of the impulse, \( |F_1 \times \Delta T| \). Incidentally, the (adjusted) breathing disturbance at crisis (\( F_{ext}[t] = A_0 \times \cos[\omega_b t] \)) used in the case with Sheep #7 in Sec. 2.3 corresponds to an alternating impulse of \( \pm 2A_0/\omega_b = \pm 0.22 \) N·s, which is about two times the maximum range of the impulse calculated by the simple model for a male human subject at rest. In the simulation, \( |F_1 \times \Delta T| = 0.101 \) N·s is used with a constant breathing rate of 13.1 breaths per minute to maximize the breathing disturbance.

Although these disturbance conditions may be inconsistent with the physiological state of an OBE experient in relaxation, these are assumed simply for the objective of this simulation to clarify technical difficulties caused by the disturbances in the supposed weight measurement experiment in OBEs. No other disturbance is assumed in the simulation.

As regards the supposed weight loss of the experient during OBE, it is assumed that a weight loss of 21 g due to OBE onset occurs instantaneously at \( t = 100 \) s and the weight returns at the termination of OBE at \( t = 500 \) s into the transient\(^3\); the calculation will be terminated at 600 s. In the simulation, a constant rate of decrease in the body weight due to insensible perspiration (i.e., moisture evaporating from the body during respiration and sweating) is assumed to be 31.5 g/h, which, based on standard physiological data, corresponds to 21% of the total daily heat loss (2100 kcal/day in a person in their 60s) from the body\(^4\). The time step size and convergence criterion used for the numerical solutions are similar to those used in Sec. 2.3.
3.2. Result of Simulation

(1) System response under disturbances. Figure 4a and b (4b is part of 4a in an expanded time scale) shows the result of simulation under the assumed disturbances. The calculated total disturbance showed a peak-to-peak swing of about
346 gf (3.39 N), out of which 306 gf (3 N) was caused by the high frequency cardiac disturbance, while the system response showed vibrations with a peak-to-peak swing of about 75 gf when the effect of damped vibration ceased. About 22% of the total disturbance is transmitted to the system response (if only the cardiac disturbance is assumed, about 8% will be transmitted). These vibrations in the system response are considered to be noise signals from the viewpoint of the supposed experimental purpose. As seen in Figure 4a and b, the system response barely shows about 20 gf of decrease in the weight of the OBE experient under the effect of the maximized disturbances.

(2) Elimination of noise from calculated system response. So long as the disturbances are as simple as those assumed here, these noises can be easily eliminated from the system response to reveal the supposed change in weight of the OBE experient by applying some noise reduction techniques to the signals of the system response. To eliminate the noises caused by the disturbances from the system response \( R(t) \), an averaging method can be applied as follows:

\[
\text{Averaged response: } < R(t') > = \frac{1}{TB} \times \int_{t}^{t+TB} R(t) dt,
\]

where the definite integral is calculated over one successive breathing cycle \( (t, t + TB) \), and time \( t' \) is defined at the mid-point of the cycle interval. The period of breathing cycle \( (TB) \) is 4.58 s.

![Fig. 5. Elimination of noise from the system response by averaging over each breathing cycle (TB = 4.58 s).](image-url)
It should be noted that the period of cardiac cycle is about 0.94 s in this simulation; hence, the one breathing cycle covers almost five cardiac cycles. The system response expressed based on Equation 4 is shown in Figure 5 (1), which clearly shows the supposed change in weight of the OBE experient. Also shown in Figure 5 (2) is a similar average of the data points sampled from all calculated data at the rate of 5 points/s. This sampling is made based on the 0.2 s response time of Hollander’s system. A small difference is seen between these two averaged results. However, these results show that if there really is some abrupt decrease in weight of the OBE experient of the order of tens of grams during OBE, the history of weight decrease can be discerned from the record of system response.

In actual experiments, we must also cope with the electrical drifting of instruments of the weighing system over the extended hours for which the experiments run; however, this issue can be dealt with technically.

However, no experimental result has been reported to show such a weight change of experients in any kind of transitions to and from altered states of consciousness, though only a very preliminary experimental report by John Hasted et al. [12] is available in this field of research. Why is this the case? Vernon Neppe and John Palmer contributed to a recently (in 2005) published book *Parapsychology in the Twenty-First Century* [13], writing an extensive review (up to the year 2002) and outlining future perspectives of research in the field of OBEs and near death experiences. However, they did not mention the possibility of an “objective” change in the weight of experients during such “subjective” paranormal experiences (SPEs in Neppe’s term). Perhaps the lack of discussion on the subject explains the reason for only few reports being available.

An OBE as an SPE, however, is very much a subjective experience as compared to the SPE of “trance channeling,” which can be obviously witnessed and controlled by experimenters during trance channeling sessions. This suggests that weight measurement experiments using a trance channeler, in comparison to OBE experiments, may be an easier way to obtain possible objective evidence, regardless of an increase or decrease in weight, of the violation of the Law of Conservation of Energy. However, the disturbances imparted to the weighing system will be greater in the former experiments.

Repetitions of MacDougall’s experiments would be ethically forbidden today, and perhaps Hollander’s type of experiments using animals will add no new value to this field of research, as shown by MacDougall, Twining, and even Hollander himself (since no anomalous change in weight upon death is not an exciting scientific result). Further, without independent confirmations of the “missing weights” of Duncan MacDougall, his experimental results mean almost nothing scientifically; this is the way of science. The only possibility of repeating MacDougall’s type of experiments may be the use of weight measurement experiments in transitions to and from altered states of consciousness. Such repeatable experiments will be much more meaningful than experiments to “weigh the soul.”
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Authentic violation of the Law of Conservation of Energy in transitions to and from altered state of consciousness, if demonstrated, will provide a breakthrough in psychology as well as parapsychology. It will also compel scientists to investigate a new energy concept that can be used to understand both psychic energy and physical energy, fulfilling the dream of psychologist Carl G. Jung (1875–1961) [14].

4. Concluding Remarks

Based on parametric simulations of the case with Sheep #7 in Hollander’s experiment, the following conclusions were drawn by using a simple analytical model of vibration for the experimental system:

(a) The experimental result with Sheep #7 appears very natural because the primary aspects of the result can be simulated theoretically.
(b) Hollander’s conclusion that “there was a transient gain of weight of 780 grams” in the case of Sheep #7 is not an appropriate expression of the experimental result because the “780 gf pulse” includes an overshoot reaction of the weighing system. However, the cause of the force event remains to be explained. It was speculated that the force event might be explained based on a sporadic event possibly expected in the complex ruminant system of sheep even after death.
(c) The experimental results with Sheep #3 and #8 appear very strange from the viewpoint of theoretical prediction. It is doubtful whether the weighing system (primarily the four load cells) functioned normally. This question could have been answered if a system response test were conducted between successive cases with a test disturbance provided externally using an inert mass on the weighing platform5.

Using the computer model for Hollander’s weighing system, an analytical simulation of a supposed weight measurement experiment was conducted for an OBE subject, assuming a weight loss of 21 g during OBE. The simulation showed that the disturbance probably caused by breathing becomes the primary noise rather than the noise from cardiac disturbance affecting the system response. However, it was shown that some noise reduction techniques can discern the change in weight of an OBE experient, if there really is a weight decrease of tens of grams during OBEs. The present author would like to suggest weight measurement experiments using a trance channeler, because trance channeling is objectively more observable a phenomenon than OBEs.

Notes

1 The frequency of data acquisition of the experimental system was 2 Hz for Sheep #3; it was 21 Hz for Sheep #7 and #8. It is confirmed, however, that even if the calculated system response shown in Figure 3b is expressed with data points sampled at the rate of 2 points (out of 133) per second, the apparent result is not changed much.
2 The maximum range of 70.8 g originated from MacDougall’s third patient. However, there is an ambiguity with regard to the language MacDougall used to describe the third patient: MacDougall wrote “My third case, a man dying of tuberculosis, showed a weight of half and ounce lost, coincident with death, and an additional loss of 1 ounce a few minutes later.” [Underline added.] The ambiguity lies in the expression “half and ounce,” which should have read “half and an ounce” if the loss was 1.5 oz. Thus, if the correct expression is “half an ounce,” then the maximum range would originate from the second patient (45.8 g).

3 The 21 g is 0.034% of 62.0 kg, and this fraction is well over the scale sensitivity of Hollander’s system (−5 g with the full-scale capacity of 100 kg).

4 Vapor mass loss rate, \( M_p \), corresponding to this heat loss rate \( Q_{ip} = 441 \text{ kcal/day} \) can be calculated as \( M_p = \frac{Q_{ip}}{\Delta_{VAPH}} = 31.5 \text{ g/h} \), where \( \Delta_{VAPH} \) is the latent heat of water vaporization (=2.444 kJ/g = 0.584 kcal/g at 25°C).

5 Hollander might have conducted such a test. However, he did not mention it in his paper [6].

References


APPENDIX

A Simple Model for the Breathing Disturbance

It is known that the surface boundary of the abdomen of a male human shows cyclic up and down motion during the breathing cycle. The model is intended to describe this up-down motion in relation to the change in the gas volume in lungs during one breathing cycle. Let us define the initial state of the gas volume as the exhaled state of the lungs and look at the change in the molar gas volume (air + CO₂), which changes as the moles of gas change. For simplicity, the rates of air inhalation and gas exhalation are assumed to be constant during inhalation and exhalation, respectively. Inhalation continues from time \( t = 0 \) to \( t = T_{B_1} \) and exhalation immediately follows until \( t = T_{B_1} + T_{B_2} = T_B \), which is the period of one breathing cycle. \( T_{B_1}/T_B \) may be \((1/3)\) in a relaxed state. The gas volume \( V_b \) will be given as follows from the ideal gas law:

\[
V_b = n \times \frac{RT}{P_a},
\]

where

\( P_a \) = pressure of the gas in the volume; assumed to be atmospheric;

\( V_b \) = the gas volume (not including the dead gas volume of the lungs);

\( n \) = moles of gas in the volume;

\( R \) = ideal gas constant;

\( T \) = gas temperature in K.

Air intake and gas discharge are facilitated by the change in the negative pressure in the pleural cavity caused by the contraction/expansion of the diaphragm and intercostal muscles. However, we do not need to get into the details of the breathing mechanism for this simple model. The up-down motion of a part of the body mass in the abdomen may cause a dynamic disturbance, to which the weighing system responds.

The model assumes that the body of the experimental subject is lying supine on the platform of the weighing system, and that the body mass \( M_b \) participating in the motion is the horizontal upper half of the abdomen with a horizontal length \( L_o \). Approximating the shape of the cross section of the abdomen to be an ellipse with a semi-major axis \("a"\) and semi-minor axis \("b"\), mass \( M_b \) may be expressed as

\[
M_b = \left(\frac{1}{2}\right) \times \pi a b \times L_o \times \langle \rho \rangle,
\]

where \( \langle \rho \rangle \) is the average density of the body.

The model assumes that the center of mass of \( M_b \) will be displaced vertically by a distance \( \delta x \) due to an increase in the gas volume \( \delta V_b \) as follows:

\[
\delta x \times S_o = \delta V_b,
\]

where \( S_o = L_o \times 2a \) and \( \delta x \) is defined as positive for vertically upward displacement.
This relationship leads to the following differential equation:

$$\delta V_b / \delta t = S_o \times \delta x / \delta t,$$  \hspace{1cm} (A3)

where $\delta t$ is the time interval in which $\delta V_b$ occurs.

The left side of Equation A3 is proportional to air intake rate, $(dn/dt)$, during inhalation, and to gas discharge rate during exhalation.

The momentum (P) of the mass $M_b$ may be expressed by using Equations A1, A2, and A3 as follows:

$$P = M_b \times \delta x / \delta t = M_b \times [\delta V_b / \delta t] / S_o$$

$$= (1/2) \times \pi a b \times L_o \times <\rho> / S_o \times [RT / P_a] \times dn / dt$$

$$= (1/4) \times \pi b \times <\rho> \times [RT / P_a] \times dn / dt$$  \hspace{1cm} (A4)

Because the gas intake and discharge rates, $dn/dt$, are assumed to be constant during both inhalation and exhalation, the momentum of the mass will be constant during both inhalation and exhalation; the former momentum is expressed as $P_1$, and the latter as $P_2$. This change in momentum will be repeated cyclically with the period of breathing, TB.

$V_b$ will reach its maximum, $V_{b\text{ max}}$, at the end of inhalation with the maximum number of moles of gas, $n_{\text{max}}$. Then, the assumed constant rate, $dn/dt$, will be expressed as follows:

$$dn / dt = n_{\text{max}} / TB_1 = V_{b\text{ max}} \times [P_a / RT] / TB_1 \text{ during inhalation,}$$

$$= -n_{\text{max}} / TB_2 = -V_{b\text{ max}} \times [P_a / RT] / TB_2 \text{ during exhalation.}$$

$V_{b\text{ max}}$ is the air volume breathed per breath. Then, the momenta $P_1$ and $P_2$ will be expressed as follows:

$$P_1 = +(1/4) \times \pi b \times <\rho> \times V_{b\text{ max}} / TB_1$$

$$P_2 = -(1/4) \times \pi b \times <\rho> \times V_{b\text{ max}} / TB_2$$

The cyclic momentum of the mass cannot change from $P_2$ to $P_1$ at the start of inhalation; neither can it change from $P_1$ to $P_2$ at the turnaround to exhalation without some action. There must be an impulse force, $F(t)$, acting to cause the change in momentum:

$$\Delta P_{in} \equiv (P_1 - P_2) = \int F_{in}(t)dt \text{ at the start of inhalation,}$$

$$\Delta P_{ex} \equiv (P_2 - P_1) = \int F_{ex}(t)dt \text{ at the turnaround to exhalation.}$$

These impulses may be caused by the actions of some muscles relevant to breathing. Assuming square-shaped impulses of $F_{in}(t)$ and $F_{ex}(t)$ with the same time duration $\Delta T$ for model simplicity, the height of the impulse will be expressed as follows:
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\[ F_{\text{in}}(t) = F_1 \text{ during } \Delta T \text{ at the start of inhalation}, \]
\[ F_{\text{ex}}(t) = -F_1 \text{ during } \Delta T \text{ at the turnaround to exhalation.} \]

\( F_1 \) will be expressed as follows using the expressions for \( P_1 \) and \( P_2 \) given above:

\[ F_1 \times \Delta T = (P_1 - P_2) \]
\[ = (1/4) \times \pi b \times <\rho> \times V_{b\text{ max}} / TB/[x(1-x)], \]

(A5a)

where \( x \equiv TB_1/TB \).

If \( TB_1 = TB_2 \), the impulse \( F_1 \times \Delta T \) is expressed as

\[ F_1 \times \Delta T = \pi b \times <\rho> \times V_{b\text{ max}} / TB. \]

(A5b)

The following data have to be specified as input to use in Equation A5a:

- \( V_{b\text{ max}} \) = gas volume inhaled/exhaled per one breathing cycle (m³);
- \( TB \) = length of one breathing cycle (s);
- \( x \equiv TB_1/TB \) = fraction of inhalation time interval per breathing cycle; \( x = (1/3) \) will be used for a typical adult at rest (note that function \( 1/[x(1-x)] \) has a very flat bottom in the range of \( x = 0.3 \) to 0.7 with the minimum 0.4 at \( x = 0.5 \);
- \( <\rho> \) = average density of human body; assumed to be equal to the density of 4% saltwater density at 20°C: 1027 kg/m³;
- \( b \) = length of minor axis of the elliptic cross section of the abdomen (m);
- \( \Delta T \) = duration (s) of the square impulse \( F_1 \); will be treated as a parameter.

Table A1 shows basic biological data used to obtain \( TB \) and \( V_{b\text{ max}} \) for the evaluation of the required impulse, \( F_1 \times \Delta T \). (The sheep data in the top table (A) are shown for comparison.) The estimated ranges of impulse, \( F_1 \times \Delta T \), are shown in the bottom table (B) for the cases of human male subjects, who may show greater impulses than female subjects. The impulses range from 0.034 to 0.101 N·s. The height of the square impulse \( F_1 \) depends upon the duration \( \Delta T \), which may range from 0.1 to 0.5 s based on muscle dynamics. However, it can be shown that the effect of the breathing disturbance on the system response primarily depends on the magnitude of the impulse, \( |F_1 \times \Delta T| \).
### TABLE A1
Basic Biological Data and Results of the Impulse Model for the Breathing Disturbance

**(A) Biological Data of Breathing of Humans and Sheep at Rest (Based on Data in a Science Handbook [8])**

<table>
<thead>
<tr>
<th>Item</th>
<th>Human male (at rest)</th>
<th>Human female (at rest)</th>
<th>Sheep (at rest)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>Air volume breathed per minute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(liters/minute)</td>
<td>5.8</td>
<td>10.3</td>
<td>4</td>
</tr>
<tr>
<td>Breaths per minute (1/minute)</td>
<td>10.1</td>
<td>13.1</td>
<td>10.4</td>
</tr>
<tr>
<td>TB (s)</td>
<td>4.58</td>
<td>5.94</td>
<td>4.62</td>
</tr>
<tr>
<td>$V_{b_{max}}$ (liters/breath)</td>
<td>0.443</td>
<td>1.020</td>
<td>0.308</td>
</tr>
<tr>
<td>Air mass per breath (g/breath)</td>
<td>0.505</td>
<td>1.164</td>
<td>0.351</td>
</tr>
<tr>
<td>Average TB (s)</td>
<td>5.172</td>
<td>5.128</td>
<td>3.053</td>
</tr>
<tr>
<td>Average $V_{b_{max}}$ (liters/breath)</td>
<td>0.694</td>
<td>0.389</td>
<td>0.347</td>
</tr>
</tbody>
</table>

Note: Only the first two rows are from [8]; the min and max simply correspond to the ranges obtained from [8]. The data in the third row and below are calculated based on the first two rows’ data; min, max, and average show only the possible ranges and average calculated using the min and max data in the first two rows. Atmospheric air density $\rho = 1.1415 \text{ kg/m}^3$ at $37^\circ\text{C}$. TB = period of breathing cycle; $V_{b_{max}} = \text{air volume breathed per breath}$.

**(B) Evaluation of the Impulse Using Human Male Data**

<table>
<thead>
<tr>
<th>Data</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{b_{max}}$ (m$^3$/breath)$^a$</td>
<td>6.940E−04</td>
<td>1.020E−03</td>
<td>4.430E−04</td>
</tr>
<tr>
<td>TB (s)</td>
<td>5.17</td>
<td>4.58</td>
<td>5.94</td>
</tr>
<tr>
<td>$x \equiv \text{TB}_{1}/\text{TB}$ (−)</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
</tr>
<tr>
<td>$\langle \rho \rangle$ (kg/m$^3$)</td>
<td>1027</td>
<td>1027</td>
<td>1027</td>
</tr>
<tr>
<td>$b$ (m)$^b$</td>
<td>0.125</td>
<td>0.125</td>
<td>0.125</td>
</tr>
<tr>
<td>Impulse $F_1 \times \Delta T$ (N·s)$^c$</td>
<td>0.061</td>
<td>0.101</td>
<td>0.034</td>
</tr>
</tbody>
</table>

Note: $V_{b_{max}} = \text{air volume breathed per breath}$; $\text{TB}_{1} = \text{time interval of inhalation}$; TB = period of breathing cycle; $\langle \rho \rangle = \text{average density of body}$; $b = \text{half abdomen thickness}$; $F_1 = \text{height of impulse}$; $\Delta T = \text{duration of impulse}$.

$a$ “6.940E−04,” for example, stands for $6.940 \times 10^{-4}$.

$b$ Half abdomen thickness “$b$” = 0.125 m is based on the present author’s body.

$c$ The impulse by the model for the body lying supine on the platform: $F_1 \times \Delta T = (1/4) \times \pi b \times \langle \rho \rangle \times V_{b_{max}}/\text{TB}[(x(1-x)]$, where $x = \text{TB}_{1}/\text{TB}$. The duration of impulse $\Delta T$, possibly ranging from 0.1 to 0.5 s, does not much affect the simulation.
An Automated Test for Telepathy in Connection with Emails

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Abstract—Can people sense telepathically who is sending them an email before they receive it? Subjects, aged from 12 to 66 years, registered online with the names and email addresses of 3 senders. A computer selected a sender at random, and asked him to send an email message to the subject via the computer. The computer then asked the subject to guess the sender’s name, and delivered the message after receiving the guess. A test consisted of 6 or 9 trials. In a total of 419 trials, including data from incomplete tests, there were 175 hits (41.8%), significantly above the 33.3% chance level (p = .0001). Hit rates in incomplete tests were higher than in complete tests. There was no significant difference between hit rates with male and female subjects. The highest hit rates were with subjects in the 20–29-year age group. The effect size in these tests was lower than in previous telephone and email telepathy tests, in spite of the fact that they were unsupervised. One reason may be that subjects were being asked to guess who had sent them a message several minutes earlier, rather than thinking about them simultaneously.

Keywords: email messages—telepathy—ESP—automated test

Introduction

Most people claim to have experienced telepathy, especially in connection with telephone calls (Brown & Sheldrake, 2001; Sheldrake, 2000, 2003). Typically, people say that they have thought of someone for no apparent reason, and then that person called, or they knew who was calling when the phone rang before answering it or looking at a caller identification display.

Telephone telepathy has been investigated experimentally by means of randomized trials in which subjects received a call from one of four potential callers (Sheldrake & Smart, 2003a,b; Sheldrake et al., 2004). These four people were nominated in advance by the participants themselves, and were usually people they knew well. In a given trial, the caller was picked at random by the experimenter. When the telephone rang, the participant guessed who was calling before the other person spoke. The guess was either right or wrong. By chance, participants would have been right about one time in four. In a total of 271 videotaped trials, 45% of the guesses were hits (effect size 0.45; p < 1 x 10−6; Sheldrake &
Callers and participants were in some cases thousands of kilometres away from each other. In a replication at the University of Amsterdam the hit rate was also significantly above chance (Lobach & Bierman, 2004).

A similar kind of apparent telepathy occurs in connection with emails: someone thinks of a person for no apparent reason and soon afterwards receives an email from that person (Sheldrake, 2003). This phenomenon has been investigated experimentally using a similar procedure to the telephone telepathy tests. Participants had four potential emailers and in each trial the sender was selected at random. One minute before the email was due to be sent, the subject guessed whom it would be from. In 137 videotaped trials, the hit rate was 47%, significantly above the chance level of 25% ($d = 0.5, p < 1 \times 10^{-6}$; Sheldrake & Smart, 2005).

In this paper we describe an automated procedure to test for email telepathy. Previous research with automated telepathy tests has involved Internet-based procedures (Sheldrake & Lambert, 2007) and a test involving text messages on mobile telephones (Sheldrake et al., in press), but this is the first time an automated email telepathy test has been carried out. The purpose of this investigation was to explore the feasibility of such a test. The experiments were carried out under unsupervised conditions so we cannot be sure that none of the participants were cheating. Hence the results cannot provide strong evidence for telepathy, however positive they may be. But developing automated procedures that can be used under “real-life” conditions almost anywhere in the world opens up the possibility of independent, supervised testing by organized groups in schools, colleges and elsewhere. This automated method minimizes experimenter effects and permits widespread participation.

In the light of results from previous research on telephone, email and Internet telepathy, our hypothesis was that hit rates in the automated email telepathy test would be above chance, but that the effect size would be smaller than in previous telephone and email telepathy tests for two reasons.

First, in experiments on telephone and email telepathy, participants were recruited on the basis of their apparent telepathic sensitivity, whereas in the experiment described here there was no such selection.

Second, in the telephone and email experiments, participants were asked to guess who was calling or emailing while the other person was actually on the telephone or writing the email. In the automated email telepathy tests, participants were asked to guess who had sent an email several minutes ago, or sometimes more than half an hour before they made their guess. Thus the telepathic contact was not simultaneous, and we hypothesized that this would reduce the effect.

**Methods**

**Procedure**

Participants registered online through Rupert Sheldrake’s (R.S.’s) Web site, www.sheldrake.org. The subjects entered their first and second names, sex, age
and email address, and also entered the names of three contacts (first names only) together with their email addresses.

All participants received a welcome email message, and the subject was told that she could stop the test at any time by emailing STOP to the system. Then the test proceeded as follows:

1. After a random time delay of between 1 and 4 minutes, the system selected one of the contacts at random and sent him a message reading, “This is the telepathy test. Please send an email reply which will be forwarded to [subject’s name]. Do not attempt to contact [subject’s name] directly. Thank you.”

2. The contact then wrote a message to the subject and sent it back to the system, which then immediately sent a text message to the subject reading “Dear [subject’s name] one of your contacts has sent you a message. Please reply and guess who has sent it. Thank you.”

3. The subject then sent an email back to the system with the name she guessed. When this had been received by the system and the data recorded, the message from the contact was sent on to the subject, who therefore received immediate feedback as to whether the guess was correct or not.

4. After a random time delay this process was repeated until the subject had completed 9 trials, at which stage the test was complete. She then received a message saying “Thank you for taking part in this test. You scored [number of hits] correct out of 9 trials. Please text the word START if you wish to do the test again.” After the first 4 months of testing, the number of trials per test was reduced from 9 to 6, but everything else remained the same.

The data were stored on an online database, accessible by the use of a password. When group leaders were recruiting subjects, they asked them all to register with the same group name, and by using this group name as a password, the leader could access the data from all members of his group. The database displayed a chronological list of results, with one line per test, giving the subject’s name, the subject’s sex and age, the date and time at which the test started, the number of trials and the number of hits. Also, separate columns showed the number of trials and hits that occurred less than 3 minutes after the contact sent a message to the subject, those that occurred 3–10 minutes afterwards, and those that occurred more than 10 minutes afterwards. In addition, for each test it was possible to display all the details trial by trial, and a full list of all messages sent and received by the system during the test, together with the time at which they were sent or received, recorded to the nearest second.

System and Programming

The system was developed and operated by Mobifi Ltd., a Short Message Service (SMS) solutions and application provider. Mobifi had an email gateway that enabled customers to send and receive email messages.
The programming environment was Microsoft Visual Studio, utilising the Tools for MS SQL Server. The core of the application was written in T-SQL, the language for operations with databases in SQL server. The version used for this application was SQL Server 2000. Microsoft SQL has its own developer utilities which were sufficient for developing this application. The standard Microsoft SQL procedures for generating seed numbers and random numbers were used to select the contacts for each test.

Parts of the application were programmed in VB Script (Visual Basic Script). This script was used to present the results on the Web. All the Web pages were ASP pages, a version of VB Script.

The application sent email messages using SQL server and SMTP server.

Inbound emails were received using a version of an email client which periodically connects to a POP3 server and downloads and copies all newly received messages to a database. This version of the email client was programmed in Microsoft Visual Studio 6.0 and in language C++.

The biggest technical problem we encountered was that some spam filters blocked emails from the system and hence some participants did not receive emails from it. To counteract this, we asked all participants to put the email address of the system in their address book, or otherwise try to stop the spam filters blocking the messages. But some participants were still unable to stop the messages being blocked and hence could not take part in the test. Also, some email systems, like hotmail.com, did not always function properly with our application, and hence some participants were excluded from the system.

Participants

Participants were recruited in two ways. First, through R.S.’s Web site, where anyone could volunteer to take part. Second, by several Research Helpers, volunteers who were taking part under the aegis of the Perrott-Warrick Project, of which R.S. is Director. These were people who wished to gain some research experience. Each of them was asked to do the test themselves and then recruit other subjects from among their friends and family members. They themselves usually served as a contact in the tests with the participants they recruited and usually registered the subjects.

Subjects were between 12 and 66 years old, with the majority aged between 30 and 39.

Statistics

The results were analysed using the binomial test; the chance probability of a hit was .33. Single-sided $p$ values were used. The null hypothesis was that the hit rate in the tests would not be significantly different from the chance level. For comparisons of different sets of data, e.g., from male and female subjects, the $2 \times 2$ chi-square test was used. Cohen’s effect size $d$ was calculated according to the formula $d = (p \text{ (hits observed)} - 0.33) / \sqrt{(0.33 \times 0.66)}$, where $p$ (hits observed) is the proportion of hits.
Results

Overall Results

In a total of 419 trials, there were 175 hits (41.8%), significantly more than the 33.3% expected by chance ($p = .0001$).

Not all the subjects completed the prespecified number of trials in a test. In some cases one of their contacts did not respond, in others they had to stop the test because they ran out of time, in some there were technical faults with the system that terminated the test too soon, and in some they may simply have decided to stop. This raises the possibility of an “optional stopping” artefact, whereby people with low hit rates stop and only those with high hit rates complete the test. However, there were 37 complete tests with a total of 276 trials, in which there were 106 hits (38.4%; $p = .03$). Of these tests, 17 had hit rates above the chance level, 10 were at the chance level, and 11 were below it. In the incomplete tests, there were 143 trials with 69 hits (48.3%; $p = .0001$). The hit rate in the incomplete tests was in fact significantly higher ($p = .05$) than in the complete tests.

In the complete tests, the hit rate in the first 3 trials was 48 out of 111 (43.2%) compared with 58 out of 165 (35.2%) in the subsequent trials. This difference was not significant at the $p = .05$ level.

Effects of Delayed Guesses

The beginning of each trial took place with a random time delay after the ending of the previous trial. There were also variable delays in the responses of the contacts to the request to send a message, some of which were due to unpredictable delays in the deliveries of emails by the Internet system and also variable delays in the responses of the contacts.

After the contact sent his message to the system, the system sent an email within a few seconds to the subject asking her to guess whom the message was from. There were variable delays before the subject made her guess and sent it back to the system, variable delays in the transmission of the email to the subject by the Internet system, and variable delays in the subject responding to the text message.

The exact times at which all messages were sent and received were recorded on the database to the nearest second. The delays in responses by the subjects after the contacts sent their messages were grouped into three categories: delays of less than 3 minutes, 3–10 minutes and more than 10 minutes. In 161 out of 419 trials (38%), the time between the contact sending his message and the subject making her guess was less than 3 minutes (Table 1). The hit rate in these trials was 42.2% ($p = .01$).

In 78 trials the delay was between 3 and 10 minutes, and here the hit rate was 32.1%, slightly below the chance level, although not significantly so. In 180 trials the delays were more than 10 minutes; the hit rate was 45.6% ($p = .0003$),
slightly higher than in trials with less than 3 minutes delay, but this difference was not statistically significant.

**Effects of Subjects’ Sex and Age**

With male subjects there were 265 trials with 115 hits (43.4%), and with female subjects 154 trials with 60 hits (39.0%). The higher hit rate with males than females was not statistically significant ($p = .37$).

The hit rates for subjects of different ages are shown in Table 2. The highest rates were in the 20–29-year age group and the lowest in the 30–39 group.

**Discussion**

Our hypothesis was that hit rates in an automated email telepathy test would be above chance levels, but the effect size would be smaller than in previous telephone and email telepathy experiments, in which the contacts were focussing on the subject when she made her guess, and in which we chose subjects who were unusually sensitive. We expected a lower effect size because the subjects in this automated email experiment were not selected on the basis of apparent telepathic ability, and also because the subjects guessed who had sent them a message only after the message had been sent. The overall hit rate of 41.8% was above the chance level of 33.3% ($p = .0001$), but the effect size ($d = 0.2$) was indeed smaller than in telephone telepathy tests ($d = 0.5$; Sheldrake & Smart, 2003b) and simultaneous email telepathy tests ($d = 0.5$; Sheldrake & Smart, 2005). We have also carried out a similar automated experiment involving SMS messages.

**TABLE 1**

<table>
<thead>
<tr>
<th>Delay (min)</th>
<th>Trials ($n$)</th>
<th>Hits ($n$)</th>
<th>Hits (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3</td>
<td>161</td>
<td>68</td>
<td>42.2</td>
</tr>
<tr>
<td>3–10</td>
<td>78</td>
<td>25</td>
<td>32.1</td>
</tr>
<tr>
<td>&gt;10</td>
<td>180</td>
<td>82</td>
<td>45.6</td>
</tr>
</tbody>
</table>

**TABLE 2**

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Trials ($n$)</th>
<th>Hits ($n$)</th>
<th>Hits (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15–19</td>
<td>4</td>
<td>2</td>
<td>50.0</td>
</tr>
<tr>
<td>20–29</td>
<td>102</td>
<td>54</td>
<td>52.9</td>
</tr>
<tr>
<td>30–39</td>
<td>136</td>
<td>49</td>
<td>36.1</td>
</tr>
<tr>
<td>40–49</td>
<td>49</td>
<td>18</td>
<td>36.7</td>
</tr>
<tr>
<td>50–59</td>
<td>25</td>
<td>10</td>
<td>40.0</td>
</tr>
<tr>
<td>60–69</td>
<td>42</td>
<td>103</td>
<td>40.8</td>
</tr>
</tbody>
</table>
rather than emails, and here too there was a low effect size, probably for the same reasons: a hit rate of 37.9% compared with 33.3% expected by chance ($p = .001$; $d = 0.1$) (Sheldrake et al., in press).

We expected that the longer the delay in the response of the subject, the lower the hit rate would be. With short delays of less than 3 minutes, hit rates were above chance, and for delays between 3 and 10 minutes, hit rates did indeed drop to chance levels (Table 1). But for delays of over 10 minutes, the hit rates were slightly higher than in trials with less than 3 minutes’ delay. A similar pattern was found in our automated SMS tests (Sheldrake et al., in press). However, in neither case was this difference significant. In future studies, it would be possible to introduce random delays into the system so that a wide range of delayed responses could be studied systematically in order to find out whether seemingly telepathic responses fall off with time after the message is sent, or not.

In this experiment, the hit rate in incomplete tests was higher than in the complete tests. Why should this be? One possibility is that subjects had higher hit rates in the first few trials because they were more involved; they may have become bored or impatient with the experiment as time went on. To test this possibility, we compared the hit rate in the first three trials of the completed tests with the later trials. The hit rate was indeed higher in the earlier trials, 43.2% as opposed to 35.2%, but this difference was not statistically significant. Nevertheless, it would be worth finding out in future automated tests whether hit rates are generally higher in earlier trials.

These tests were unsupervised, and therefore the possibility arises that some people were cheating. However, the hit rates were relatively low, and many people scored at or below chance levels; cheating could not have been common, otherwise hit rates would have been much higher. And most people had no motive to cheat; they were curious about their own abilities and wanted to find out how they would fare in the test. Nevertheless, we cannot rule out the possibility that some people cheated some of the time.

The best way to rule out cheating is to carry out supervised tests in which the subjects are filmed continuously, and then the films are examined carefully by an independent evaluator, so that any trials can be disqualified in which subjects receive telephone calls or emails or text messages, or in which a third party passes on any information to them. Procedures of this kind have in fact been used in tests on telephone (Sheldrake & Smart, 2003b), email (Sheldrake & Smart, 2005) and SMS telepathy (Sheldrake et al., in press). Even when all these possible kinds of cheating were ruled out, the hit rates were well above chance.

Unsupervised tests are valuable in their own right for an exploration of a new method, as in the present study, and also for comparison of variables that affect hit rates. In this experiment, we studied only sex and age, and found no significant differences.

This experiment shows that automated email telepathy tests are feasible, but that an email system of this kind is not a good way to test for telepathy simultaneously, which is how it seems to occur in real life (Sheldrake, 2003).
of these trials involved delays between the contact sending the email and the subject guessing who had sent it, during which time the caller’s attention has shifted elsewhere. The effect size was low, even in unsupervised trials where cheating was possible. We conclude that this way of studying telepathy is not very effective. The same is true of SMS test systems, which also suffer from built-in delays between the contact sending the message and the subject making a guess.

To avoid the problem of delays, an automated system for testing telepathy must involve the subject making a guess while the contact is focussing on her. Simultaneity could be achieved by means of an automated test for direct telephone telepathy in which randomly selected contacts telephone the subject via the system and are asked to hold on while the subject makes her guess. The line opens up only after the guess has been recorded by the system, and the two can then talk. Our next experiments will involve an automated system of this kind.

References


ESSAY

Brain and Consciousness: The Ghost in the Machines

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Abstract—This paper reviews four current theories of brain-consciousness relations—classical Cartesian Dualism, the Identity Theory, Eliminative Materialism, and a new form of Substance Dualism that includes a modified form of the Cartesian theory. This entails a critical examination of our basic concepts of what consciousness is, of the nature of the body image, and the relation of phenomenal space to physical space. This investigation reaches the same result as that attained recently by the physicist Bernard Carr (2008)—that what is needed is a paradigm shift in our basic concepts of the geometry of the Universe. In order to understand phenomenal consciousness we need to replace the present four-dimensional model with a higher-dimensional structure, in which a phenomenal space (with its contents) and physical space (with its contents) are different cross-sections (branes) of a higher-dimensional space (the bulk).

Keywords: brain—consciousness—mechanisms—substance dualism—brane theory

Introduction

The scientific account of a person’s consciousness and its relation to her brain that is most prominent today holds that the brain is no more than a single vastly complex electrochemical machine. The function of the brain is to discover what is going on in the physical world around the organism and to use this information to guide behavior optimally with respect to the short-term and long-term needs of the organism. The pinnacle of this information-processing and control system is held to be manifest as phenomenal consciousness—the world that a person’s Self experiences—the microcosm inside the macrocosm—that is constructed by the representative mechanisms of perception that have their terminals in the brain.

The account of brain and consciousness presented in this essay extends this concept one stage further. Currently it is widely believed that the physical body (plus its brain) is the only organism that a human being possesses. However, this is not a necessary truth but only an a priori assumption. I suggest that phenomenal consciousness is also a highly organized and complex entity. Up to now this organization has been accounted for either by identifying phenomenal consciousness and its brain in various ways, or by the Cartesian denial that any such organization
exists. What is missed by this dichotomy is the possibility of a substance dualism in which a phenomenal consciousness (a person’s ‘consciousness module’) and its brain are two ontologically independent parts of a human organism located in different but related spaces (in two of the parallel universes of brane theory), and connected by causal relations (mechanism). The Cartesian theory is a form of Substance Dualism in which one party is material and the other is not (‘the ghost in the machine’ or ‘unextended thinking spirits’). The key difference between the two Cartesian realms is extension in space—physical matter is extended, mind is not. In this new theory (Material Dualism or Extended Materialism) both realms contain material, and both are spatial. Each is in a brane of its own, and both branes are cross-sections of a common higher-dimensional bulk. Key differences between them are the type of material contained in each (atoms versus phenomenal objects) and their spatial location relative to each other. There is not one machine with its attendant ghost: there are two machines. However, as we will see, it will be necessary to introduce a modified form of the Cartesian theory to complete the theory so as to explain the Self.

The traditional classical Cartesian doctrine, that humans consist of body (including its brain) and a mind, is not fashionable in Academia today. In its place we are witnessing a vigorous competition between two rival theories. One is provided by the monistic mind-brain Identity Theory of cognitive neuroscience. The other is neo-Wittgensteinian philosophy, that holds that the answers to the mind-brain problem come from analytical philosophy, and a study of ordinary language, not neuroscience (Bennett & Hacker, 2003). The present essay presents arguments that suggest that all three of these theories are mistaken.

What Phenomenal Consciousness Is

There are two main senses of ‘consciousness’ in the current debate. The first is the medical-behavioral sense, as when the nurse says, “The patient is recovering consciousness, Doctor.” This can be investigated by studying those brain states that result in coma (Smythies, “The Neurochemistry of Consciousness,” in press) and by brain imaging studies that identify those neurons and brain areas (the neural correlates of consciousness, or NCCs) whose functions co-vary with various states of consciousness. The second is the phenomenal Lockean sense, in which consciousness is all that we experience—a person’s own sensations, images, feelings, memories and thoughts. This can be studied by introspective methods used in psychophysics and perceptual science (as, for example, when we examine the properties and behavior of an after-image). “For example much of our visual consciousness presents itself as being extended, images and after-images having shape, size and location in the visual field, and we describe the phenomenal realm of which we are aware as a ‘manifold’…” (Allen, 2006). Subsidiary methods study the link of consciousness to such functions as attention, as well as to how terms like ‘see,’ ‘mind,’ ‘consciousness’ and ‘hallucination’ are used (a) in ordinary speech and (b) in a psychological laboratory. This essay will focus on phenomenal consciousness.
Francis Crick (1994) provided good arguments against trying at this stage to define consciousness: it is better at this early stage in our enquiry to try our best to describe it. Schilder (1942, 1950) introduced the useful strategy of starting this task at the simplest level. So stretch yourself out on your bed in the dark and ask yourself what you can observe. Most people would say at first “Nothing.” However, further observation shows that this is not right. As Ladd (1892) reported “Ask people what they customarily see when their eyes are closed in a dark room and they will reply that they see nothing. Ask them to observe more carefully and describe what they see, and they will probably speak of a dark mass or wall before their eyes.” Schilder (1942) said, “Even with our eyes closed, black is perceived as a spatial relation.” And Wright (1981) states, “Blackness, as Locke knew well, and Lord Brain has reminded us, is a positive state, i.e. it is a sensory condition of the mind’s presence room [that is, the visual field].”

What more can we say about this black expanse that makes up the primitive visual field? Firstly it is limited, not limitless, in extent. It does not have a clear-cut boundary but, nevertheless, fades out at the periphery. Its shape is roughly circular—certainly not squareish, for example. Moreover, there is only one such expanse, not two, although we can easily imagine what it would be like to have two or more. Galton (1883) takes it further: “I should have emphatically declared that my field of view in the dark was essentially of a uniform black, subject to a light purple cloudiness and other small variations. Now, however, . . . I have found out that this is by no means the case, but that a kaleidoscopic change of patterns and forms is continually going on, . . .”

During the earliest stage of mescaline intoxication I have observed that these kaleidoscopic patterns are potentiated and evolve directly into the hallucinations typical of the psychedelic state. During sensory deprivation experiments, this black field can develop a much more intense black color—super-black—and can become three-dimensional. “The black curtain in front of the eyes [read ‘eyes of the body image’] gradually opens out into a three-dimensional dark, empty space in front of the body [read ‘body image’]. The phenomenon captures one’s interest immediately, and one wants to find out what comes next” (Lilly, 1956).

Schilder’s ‘primitive’ visual field can also be studied by the Ganzfeld technique. A ping-pong ball is cut into two and one-half is cupped over each eye. This results in a white and featureless visual field that is seen as a “mist of light” or a “filmy surface” separated from “me” by empty space (Cohen, 1957). This homogeneous Ganzfeld was reported to be “close at hand” or “just in front of the eyes” by all Cohen’s subjects. The modal judgment of this distance was about 2 inches.

Thus, the primitive visual field may be observed to have a number of properties.

1. There is just one visual field.
2. This has intrinsic spatial extension (two dimensional) as well as a three-dimensional distance from the observer.
3. It has spatial properties—i.e., a center, a periphery and an overall shape (roundish).
4. It is colored, with black as apparently the default color.
5. There is an observer (“me”) set back by an apparent 2 inches.

The system also has a cognitive dimension. The field does not just exist, basic or complex, but is always taken up into perception of some kind, either in everyday life, or as part of some psychological experiment. In the latter I typically observe its features and can name them—e.g., “there’s a red after-image,” “that’s a veridical percept that shows me that there is a red rose out there,” etc. Neurological lesions show that the phenomenology and the epistemology of this system are processed by different brain mechanisms. In associative agnosia the patient can see perfectly well but cannot recognize what she is seeing (De Renzi, 2000). In blindsight the patient can see nothing but can recognize (“guess” correctly) what the object ‘out there’ is, including its color. Blindsight is mediated by pathways that pass directly from the lateral geniculate body to the higher visual cortex in the left occipito-temporal area by-passing the primary visual cortex.

One must also distinguish between the Self (“me”) and what I experience. As Maund (2008) puts it, “. . . there are at least two aspects to knowing what it is like to have a certain experience. One concerns what it is like to be the subject of an experience; another aspect concerns the ‘phenomenal’ or ‘qualitative’ character of the experience.” I will deal with what is experienced first and then return to the Self later.

When I open my eyes in the light, the visual field changes instantly and becomes filled with organized, coherent patches of color that I take naively to be direct views of the contents of the world around me—what Crick (1994) called “the vivid picture of the world that we see in front of our eyes,” and again, “Our inner visual picture of the external world has a unity.” Broad (1923) describes the visual field as follows: “So long as it is light and one’s eyes are open, one really is directly apprehending something, though it is not what one uncritically takes it to be. This something is an extended, spatially continuous, variously colored and shaded field, which is presented as a finite but unbounded whole.”

This account of the visual field, as presenting a picture of the external world, can be thought of as incorporating the principles (but not of course the exact details) of the mechanism by which television works, and has been almost uniformly rejected by contemporary philosophers and vision scientists on the grounds that no such pictures are to be found in the brain, and because this hypothesis leads to a nasty infinite regress of little green men in the head (more on this later).

In the case of somatic sensation most people still believe that the familiar ‘body’ that they experience simply is the physical body composed of muscles, bones and organs. The pain of a toothache is simply in the physical tooth. As Descartes (1931) put it, “Nature also teaches me by these sensations of pain, hunger, thirst, etc. that I am not only lodged in my body like a pilot in a vessel, but that I am very
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closely united to it, and so to speak, so intermingled with it that I seem to compose with it one whole.”

However, observations from clinical neurology show that this view is, in one particular, mistaken. The vessel of Descartes’ pilot is not the physical body, but it is the body image that is composed of all manner of somatic sensations: “The brain creates a body image, and pains, like all bodily sensations, are parts of the body image” (Searle, 1992). The pain of a toothache is not located in the physical tooth but in the tooth of the body image.

Most people are familiar with the fact that individuals who have had a limb amputated still report afterwards feeling the limb. Philosophers tend to dismiss this as a ‘delusion’ or an ‘illusion’—i.e., as not ‘real.’ However, it is neither. A delusion is a false belief. The person who says she experiences a phantom limb is telling the truth. She does not claim to have a real limb, which would be a delusion. She reports correctly that she has a somatic sensation. An illusion is the misperception of a real object. A phantom limb is not the misperception of a real limb since there is no real limb. A phantom limb is, rather, a hallucination. It does not represent a new order of being. A phantom limb is just the old familiar phenomenal limb that is still generated by brain mechanisms in the absence of any input from the physical limb. The neurons that generate it are located in the parietal cortex. Removal of this cortex abolishes the phantom. Phantom limbs can often be moved either voluntarily or involuntarily, as when the limb extends automatically to ‘catch’ a ball thrown at the person. As for reality, the pain in a phantom limb is at times real enough to drive the patient to suicide. Nor is a phantom limb some kind of learned phenomenon, for people with congenital absence of limbs can report phantoms (Ramachandran & Blakeslee, 1998).

Nida-Rümelin (2008) gives a good example of the confusion of the body image and the physical body. “We see the [colors] outside there on the thing perceived . . . when reflecting on the phenomenal character of our own experience we are not looking inside. We are not perceiving what is going on in our brain or looking into some inner space” (pp. 314–315). On the contrary, phenomenal colors are only located outside relative to the body image, and not outside relative to the physical body. A phenomenal color is a part of my visual field, which the evidence suggests, in my opinion, is a part of my own organism.

However, to avoid philosophical confusion, it is better not to say that we perceive what is going on in our brains, or in our private phenomenal spaces, since, by definition, we should say that we perceive only external objects. Sensations are only a part of the process of perception, but we do not perceive sensations. Psychologists, during the course of their experiments, can examine or observe (but not perceive) their own sensations, veridical or hallucinatory, but that is for different purposes. We do not say that we perceive what is going on in our brains, not for the reason Nida-Rümelin gives, but because we cannot confuse a part of a process with the whole process. Having sensations is the last step in the complex representative chain of perception. Perceiving external physical objects involves the whole chain.
Vision and Television

The current scientific account of how vision and visual consciousness works extends from retina to cortex. A great deal is known about how the information delivered on the retina is transposed by numerous serial and parallel neurocomputations at all levels into the activation of specific patterns of neuronal activity in the visual brain. In a recent review Mesulam (1998) says that brain mechanisms help to create a highly edited subjective version of the world. The question then remains—what is the relation between this “highly edited subjective version of the world” in the brain and the ever-changing contents of a phenomenal consciousness? As Grossberg (1987) says, “When we gaze upon a scene, our brains combine many types of locally ambiguous visual information to rapidly generate a globally unambiguous representation of form-in-color-in-depths . . . how do . . . multiple sources of visual information preattentively cooperate to create a three-dimensional form?”

The visual field presents in some sense the end result of all these neurocomputations. But how does the system convert the buzzing activity of billions of neurons into Crick’s “our vivid internal picture of the external world”? When I examine my visual field I can see Crick’s point. I can readily understand the claim that it is a picture of the world and a televisual picture at that. A ‘television’ theory of perception is any theory that states that the visual field in consciousness is constructed by some form of representative mechanism. An ordinary television picture is built up by a specific mechanism—a raster in the case of older analog systems, and pixels in the case of digital television. If I examine my visual field I can detect no signs of grain betraying a raster or a pixel system, but I can easily imagine what it would be like to do so. In the case of a digital system there would be small dots in my visual field: in the case of an analog system there would be thin lines. Therefore, if there is such a system, it must be extraordinarily fine grained. That is not impossible, yet many people claim that there are insuperable difficulties to a televisual theory of visual perception. I will therefore review these difficulties.

The Missing Pixels

One criticism of any television theory of visual perception and phenomenal consciousness is that it says that vision ends in a series of television images, yet, when one looks into the brain, there are no such images to be found. The conclusion usually drawn is that no such images exist. Therefore we should throw the TV theory out. However, there is another conclusion that may be drawn, and that is that these TV images are not in the brain but in the mind. This theory may be put as follows. The key points are (1) phenomenal space and physical space are not different aspects of the same space, but are different spaces, or different subsections of a common higher-dimensional space. “. . . there is equal motivation to distinguish subjective or phenomenal space from that invoked in our physical descriptions of the world” (Allen, 2006). “All this [the physiological account of
perception] has a consequence that has not been adequately recognized, namely that the space in which the physical table is located must be different from the space we know by experience” (Russell, 1948). (2) Phenomenal space is not an empty abstract space, but has real contents, e.g., the body image and ‘phenomenal visual scenes’ that a neurologist would call visual sensations. (3) Phenomenal consciousness is the final step of a TV mechanism (as defined above). (4) The human organism (physical body + a consciousness module) is distributed in both realms. (5) There are two types of real matter in the cosmos—physical stuff (e.g., atoms, brains, stars) located in one space, and mind stuff (sensations, images and thoughts) located in another space. Both generate equally real events that interact causally in both directions. This point requires further elaboration. One could say that minds are entities made of mind stuff and that experienced sensations, images, thoughts, and feelings would then be states, processes or functions of the substantial mental system. Alternatively one could say that sensations, images, thoughts and feelings are different kinds of mind stuff and that their coexistence in a consciousness module makes up a substantial mind. These could perhaps be combined with the statement that we are dealing here with a whole—a consciousness module—made up of a number of different parts—sensations, images, thoughts and feelings. We then have to ask, as the various modalities of sensations, images, feelings and thoughts appear to be somewhat different from each other, what are the attributes that (a) put them in the same class and (b) how can these attributes be varied so that a visual sensation can be differentiated from an auditory one and both from a feeling or a thought? To this we could answer that the attribute (a) they all share is to be located in the same consciousness module (and not in the physical world) and to belong to the same Self. Other collections of these items, of course, will be located in other consciousness modules and will belong to a different Self. The attributes (b) that enable us to differentiate them are firstly their obvious qualitative differences (think of a bright red visual after-image and a deep humming sound) and, in addition (i) that sensations are the terminal happenings (parts, events, structures) of a representative mechanism (which thoughts, feelings and images are not); (ii) that visual and somatic sensations are spatially extended, whereas thoughts and feelings are not; and (iii) the Self owns all the others, whereas none of them owns the Self (more on the Self later).

Another important question needs to be addressed. The theory suggests that each person has his or her own unique consciousness module embedded in a brane. So do all consciousness modules float around, as it were, in one common brane? Or does each consciousness module have a brane all to itself? If we cut a number of planes out of a cube we can confine our cuts to the cube, like cutting slices of toast out of a loaf of bread. Or we can add extra dimensions for each slice, thus enlarging the cube dimensionally to a tesseract and successively beyond. In this second model the Universe has vastly more spatial dimensions than it does in the first. There is no means of telling which is correct. This is an empirical matter, at present beyond our reach. A Flatlander can have her physical
body in plane A and her consciousness module in a second plane B that intersects A. A second Flatlander, with his body in A, can have his consciousness module in B, or in a third plane C, that also intersects A, and so on for any number of Flatlanders through D to n.

Then it might be asked, if sensations, images, feelings and thoughts turn out to be some type of material entities located in a space of their own outside physical space, what becomes of the concept of ‘mind’? To this one can reply that none of the discussion presented so far applies to Ryle’s (1949) dispositional concept of the nature of mind, which is logically different from the phenomenal sense of ‘mind’ used in this essay that describes the structures and events that can be observed by introspection, and the entity—the Self—that is doing the observing. A suitable machine (organism, super-computer) can be dispositionally intelligent, diligent, tenacious, deceitful, etc., no matter what it is made of; whereas phenomenal consciousness requires a particular structure in line with what we can introspectively observe.

The theory of extended materialism was first formulated by the great chemist Joseph Priestly in 1777. He first points out that the concept of the soul, or mind, as an immaterial substance was, in 1777, a novel idea introduced by Descartes. Before him, and to this day in Hindu philosophy, a dualist mind or soul was thought of as an “attenuated ærial substance” made of so fine a material as to be undetectable by the senses. Priestly continues, using Locke’s concept of ‘idea’:

The vulgar who consider spirit as a thin, aerial substance would be exceedingly puzzled if they were to endeavour to realize the modern idea of a proper immaterial being, since to them it would seem to have nothing positive in its nature, but only a negation of properties, although disguised under the positive appellation of spirit. To them it must appear to be the idea of nothing at all, and to be incapable of supporting any properties. It will not be denied but that sensations or ideas properly exist in the soul, because it could not otherwise retain them. . . . Now whatever ideas are in themselves, they are evidently produced by external objects, and must therefore correspond to them; and since many of the objects or archetypes of ideas are divisible, it necessarily follows, that the ideas are divisible also . . . and how is it possible that a thing (be the nature of it be as it may) that is divisible, should be contained in a substance, be the nature of it likewise be what it may, that is indivisible.

If the archetypes of ideas have extension, the ideas expressive of them, and actually produced by them, according to certain mechanical laws, must have extension likewise; and therefore the mind in which they exist, whether it be material or immaterial, must have extension also. But how anything could have extension, and yet be immaterial, without coinciding with our idea of mere empty space, I know not. I am therefore bound to conclude, that the sentient principle in man, containing ideas which certainly have parts [is] not the simple, indivisible, and immaterial substance that some have imagined it to be; but something that has real extension and therefore may have the other properties of matter.

Thus Priestly presents the first formulation of a robust material dualism in which the mind (phenomenal consciousness) is postulated to be composed of a type of matter extended in a space of its own. As he says “The mind . . . is not immaterial substance . . . but is something that has real extension and therefore may have the other properties of matter.”
The next stage in the development of this type of material dualism was taken by C. D. Broad (1923), who enquired into the nature of the space in which sensations (sensa) may be extended.

For reasons already stated, it is impossible that sensa should literally occupy places in scientific space, though it may not, of course, be impossible to construct a space-like whole of more than three dimensions, in which sensa of all kinds, and scientific objects literally have places. If so, I suppose, that scientific space would be one kind of section of such a quasi-space, and e.g. a visual field would be another kind of section of the same quasi-space. (pp. 392–393)

Putting Priestly’s and Broad’s suggestions together we get a picture of a phenomenal consciousness as a spatially extended and material entity located outside the brain in a space of its own that is one cross-section of a higher-dimensional space, of which another cross-section encompasses the physical world. The next step was contributed by H. H. Price (1953), who saw that these two entities must be connected by a new type of causal relation that connects events in parallel universes. Further details of this new theory were supplied by Smythies (1956). The concept that phenomenal space and physical space are ontologically different spaces has also been expressed by Ayer (1940), Russell (1948), Moore (1971) and Carr (2008) (and see Smythies, 1994: 149–150, for details).

This new theory takes care of the ‘pictures in the brain’ problem. The pictures that fill a person’s visual field are, the theory suggests, located outside her brain in her consciousness module. They are constructed by a TV-like mechanism. Part of this mechanism (that functions like the computer inside a digital TV system) is located in her brain. The other part consists of the TV screen itself (her visual field), plus a connecting mechanism. This abstracts the information from the brain and throws it onto the visual field (more on this below). A similar process operates in the case of her other senses. So we no longer have to worry about how mechanisms as different as nerve nets in the brain and sensory fields in consciousness could, in some sense, be identical. Experimental evidence, fatal to naïve realism, that the brain employs information compression technology and virtual reality mechanisms, as does TV, has been reviewed elsewhere (Smythies, “Philosophy, Perception and Neuroscience,” in press).

The Little Green Man

This account has been criticized by some (e.g., Crick, 1994; Descartes, 1931; Ryle, 1949) on the grounds that talking of internal pictures in this way leads to the infamous ‘homunculus’ and an infinite regress of little green men in heads. The argument runs as follows: We cannot allow for vision to include internal pictures, because, if we do, we have to ask what inside the person is looking at these pictures, and, as Crick (1994: 24) pithily put it, “trying hard to understand what is going on.” This means that we have to posit a little green man inside our heads, and inside that little green man’s head, there must be another little green man, and so on.
However, as Fodor (1981) pointed out, this argument is invalid. He says that the fact that seeing an object requires an image in our minds does not in the least entail that experiencing the resulting image requires the same mechanism (i.e., another picture in the observing Self). The two processes are essentially different. The mechanistic process that connects the retina to the visual field (i.e., extremely sophisticated television) is quite distinct from the ostensibly-indicated interaction between a Self and its visual field.

As I have not yet discussed the Self, this, I feel, is the point to do so. This will require us to reintroduce a modified form of Cartesian Dualism into the theory. Some philosophers (e.g., Berkeley) believe in the existence of the Self. As he said (1949), “How often must I repeat, that I know or am conscious of my own being; and that myself am not my ideas, but somewhat else, a thinking active principle that perceives, knows, wills and operates about ideas. I know that . . . I am therefore one individual principle, distinct from color and sound; and, for the same reason, free from all other sensible things and inert ideas.”

Others do not believe in the existence of the Self. Here I side with Descartes and Berkeley. Logically there cannot be experiences without the existence of a subject they are the experiences of. However, the Self is not located in the head of the physical body—like a pilot in a vessel—as Descartes put it. It is rather located in the head of the body-image, which is itself a mental entity.

Verbal definitions of the Self are hard to achieve. So, perhaps, an ostensive definition is better. In this you tell a person to concentrate on, e.g., an after-image and tell you its color and shape—which she will easily be able to do. Then you can ask, during this exercise, whether she noticed that there was more than just an after-image involved: surely there was also her “me” doing the examining, and such a Self is not extended in space. Likewise, in a dream there is not just a collection of dream images; there is also a dream Self wandering around in the dream world experiencing all that is going on therein.

So a complete account of a consciousness module describes a complex structure with some spatially extended parts (visual and somatic sensations and images) plus some unextended parts (thoughts and the Self).

**Further Advantages of Material Dualism**

These further advantages of Material Dualism may be highlighted by comparing it with the competition.

(i) The Identity Theory (IT) states that phenomenal entities (events) are identical with certain neural entities (events). As we have seen earlier, phenomenal entities have observable properties of color, shape and movement. Their NCCs also have properties in the same categories. These specifications of each property are different in each case. Thus, IT runs afoul of Leibniz’s Law of the Identity of Indiscernibles, which states that identical entities must have identical properties. NCCs certainly carry the same information about what’s “out there” as do sensations, but they are in different forms. The visual cortex has a topographical
code (over 30 individual maps) plus a vectorial code. The visual field has only one topographic code and no vectorial code. How could they be identical? Besides, it is hard to accept the proposal that a familiar phenomenal object is really just electrochemical activity in a collection of neurons. It looks like an image on a TV screen, not a mass of neurons. Identity theorists may hold on to their theory in the laboratory but, in everyday life, they are naïve realists like everyone else.

The theory of Material Dualism does not have this problem. In that theory the only thing that neurons do is to generate complex patterns of electro-chemical activity (Smythies, 2002) that co-vary with the sensory input, perform computations on that input modulated by memory (see below) and generate behavior. There is no need to invent tortuous reasons whereby they are identical with phenomenal objects, or with any ‘act of perception.’ Internally they simply do their own thing. Externally the new theory postulates that they bear causal relations with the contents of phenomenal consciousness.

The theory presented here is essentially the same as that presented by Carr (2008). It differs from that published by Paul Marshall (2005), who is concerned with the nature of the higher reality experienced by mystics. He supports a Leibnizian panpsychic idealism. In contrast, the theory that Carr and I support is a realist theory. Nevertheless, it can explain the facts discovered by parapsychologists (as Carr details) and it can present a plausible account of the place of a human soul in ‘next world’ along lines similar to those that Price (1953) proposed.

(ii) Eliminative Materialism (EM) ‘solves’ the problem of the relation of phenomenal objects and their NNCs by denying the existence of the former. We are asked to believe that Crick’s “vivid internal picture of the world” does not exist and that we are merely suffering from delusions when we claim that it does. EM theorists equate phenomenal objects with things like phlogiston and the luminiferous ether, that do not exist either. However, these do not provide good models. We experience phenomenal objects, but not phlogiston and the ether: “Churchland’s systematic denials of qualia are transparent fallacies of ambiguity” (Crooks, 2008).

The lack of plausibility of EM can further be demonstrated as follows. The theory says we have no experience of phenomenal objects, yet we see perfectly well. However, there are people who really do not experience phenomenal objects. They suffer from cortical blindness due to occipital lobe damage. There are other people who can identify external objects, but cannot see them. They are the patients with blindsight. So a critic of EM can claim that what EM theorists are claiming to be normal perception is what in fact would happen in the case of a patient with occipital lobe damage and 100% accurate blindsight. Since no one would claim that such a patient has normal vision, it would seem that EM runs into difficulties.

Sherlock Holmes once said that, when trying to solve any problem, one must first eliminate the impossible: then, whatever is left, no matter how improbable,
must be the truth. I suggest that Naïve Realism, the Identity Theory and Eliminative Materialism are all impossible theories for the reasons reviewed above. But, however startling it may appear to ‘common sense,’ material dualism is not. It contains no impossible elements.

(i) The concept that the Universe may be composed of parallel universes is already part of brane theory in modern physics (Carr, 2008).

(ii) Brane theorists at present have only thought of the contents of any universe(s) parallel to our own physical universe as being composed of similar material (quarks, etc.). However, a parallel universe could contain anything, including sensations and the postulated TV-like mechanism that transduces brain states to sensations. This mechanism, if such exists, must contain two parts. If we consider only vision, there is (i) the part that actually constitutes the visual field carrying its picture of the external world. This corresponds to the screen of a TV set in that model. But a TV-like mechanism cannot consist of just a screen, there must be (ii) a mechanism behind the screen that extracts the requisite information from the visual cortex and delivers it to the screen. This it could easily do, as every point in the brain is immediately in contact with the higher-dimensional space surrounding it—just as every point in a plane is in immediate contact with the cube of which the plane is a cross-section. We cannot observe this mechanism by introspection for the same reason that we cannot look through the screen of a TV set into the works behind. And we cannot see it by vision, as it lies in a parallel universe outside the range of light cones in our physical space. It should be noted, however, that parallel universes are parallel because of their location in space, not because they are in causal isolation from each other (Price, 1953).

(iii) Physics at present only considers causal relations between entities in one four-dimensional (4D) universe, and uses only 4D vectors for that purpose. However, there could logically be causal relations between events in parallel universes (Price, 1953). All that is required are five (or greater than five) dimensional (D) vectors. An ordinary vector is a directional line joining two points in a 3 space (or a 4 space-time). To obtain a 5D vector, take two 4D cross-sections (A and B) of a 5 space. Then a directional line joining any point in A to any point in B would be a 5D vector (Smythies, 1994).

(iv) The theory is open to experimental test (see Smythies, 1994, for details).

(v) The really startling feature (for stolid ‘common sense’) of material dualism is the already-established fact that we do not experience our own physical bodies at all. I have become so accustomed to the idea that my oh-so-familiar ‘body,’ that I feel wrapped around me, as it were, every moment of every waking day—Descartes’ vessel in which the pilot is so snugly ensconced—simply is my body that it comes as a severe shock to
realize that it is not my physical body at all, but rather an image of my body constructed by my brain. Once one has gotten over that hurdle, the rest is easy.

Conclusion

Allen (2006) has suggested that, in order to understand consciousness and its relation to the brain, it may be necessary to engineer a paradigm shift in our concepts of space and time. Penrose (1989: 144) stated “It is my opinion that our present pictures of reality, particularly in relation to the nature of time, is due for a grand shakeup—even greater, perhaps than that which has already been provided by present-day relativity and quantum mechanics.” Carr (2008) and I suggest that such a player is already on the stage. The fact that this player has taken so long to appear may be traced in part to the fact that higher-dimensional geometry was not available to Joseph Priestly in 1777.

References

HISTORICAL PERSPECTIVE

From Astronomy to Transcendental Darwinism: Carl du Prel (1839–1899)

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Abstract—German philosopher Carl du Prel (1839–1899) was a leading theoretician and proponent of research into dissociation, hypothetical postmortem survival, alleged psi phenomena and related areas. The impact of his works on several more widely known authors within and outside psychical research was often considerable. This article provides a concise biography of du Prel, gives an overview of his model of mind, and finally suggests avenues of research which were pursued by du Prel but nowadays are largely forgotten.

Keywords: Carl du Prel—Eduard von Hartmann—altered states of consciousness—survival research

Introduction
Recent works in cultural history have identified philosopher and psychical researcher Carl du Prel (1839–1899) as a hitherto obscure key figure in the intellectual scene of fin de siècle Germany (see, for example, Kaiser, 2008; Treitel, 2004; Weber, 2007). Du Prel, whom Sigmund Freud, in his Interpretation of Dreams, called “that brilliant mystic”¹ (Freud, 1900/2000: 68 FN), arguably had a certain influence not only on other psychologists, such as Carl Gustav Jung (Shamdasani, 2003) and potentially Frederic W. H. Myers (see below), but also on several artists of fame, for example, Wassily Kandinsky (Treitel, 2004) and the poet Rainer Maria Rilke, who was an outspoken admirer of du Prel (Magnusson, 2008). The present paper aims to provide an outline of du Prel’s life and work and a brief introduction to his ideas in psychical research and philosophy.

Biographical Sketch
Baron Carl du Prel was born on 3 April 1839 in Landshut, Bavaria, from which his family, who had originated from old Lorraine nobility, moved to Munich shortly after his birth.² In 1858 he entered Munich University to study law but joined the Bavarian army 2 years later, serving as a lieutenant and officer until
1872. In 1868 he received his Ph.D. in philosophy *in absentia* from the University of Tübingen. His thesis, a philosophical study of the metaphysical implications of temporal divergences in dreams, was published in the following year (du Prel, 1869). From 1872 du Prel pursued a career as a freelance writer and began to publish a large number of articles and essays on philosophy, aesthetics, literature, astronomy, and psychical research, several of which were subsequently compiled in book form (Kaiser, 2008).

Du Prel’s philosophical starting point is rooted in Kantian epistemology and the metaphysical systems of Arthur Schopenhauer and Eduard von Hartmann (1842–1906), with whom he corresponded over a span of 16 years. In his early years du Prel studied not only the implications of dreams for philosophy and psychology, but also astronomy and the works of Darwin, leading to the publication of his first critically acclaimed monograph, which is a proposal to apply the principles of natural selection to astronomy (du Prel, 1873/1882). A later astronomical study, involving epistemological speculations about the bodily organisation and thus the nature of perception in hypothetical inhabitants of other planets (du Prel, 1880a), eventually led him to acknowledge the logical possibility of supernormal phenomena as a result of our epistemic limitations. Before publishing his groundbreaking *Die Philosophie der Mystik* (*The Philosophy of Mysticism*, du Prel, 1885), he wrote a hiking guidebook for the Alps, Italy, Dalmatia, and Montenegro (du Prel, 1875) and a treatise on the psychology of artistic productions (du Prel, 1880b), the latter of which anticipates several crucial elements of his theory of the unconscious, later to be presented more systematically in *Die Philosophie der Mystik* and *Die Entdeckung der Seele durch die Geheimwissenschaften* (*The Discovery of the Soul through the Secret Sciences*, du Prel, 1894–95).

In 1886, du Prel became a founding member of the Munich Psychological Society, which was formed after the example of the British Society for Psychical Research (SPR) and which published the journal *Sphinx*, an important early German psychical research periodical. Other members of the Munich Society were theosophist Wilhelm Hübbe-Schleiden (1846–1916), the physician Albert von Schrenck-Notzing (1862–1929), later to be known for his researches in physical mediumship, and the young philosopher and psychologist Max Dessoir (1867–1947), who coined the term “Parapsychologie” (Hövelmann, 1987), but also renowned artists like Albert von Keller (1844–1920) and Gabriel von Max (1840–1915).

Du Prel’s defence of the reality of reported physical phenomena of spiritualism against Eduard von Hartmann’s proposal to explain the effects in question in terms of hallucinations (von Hartmann, 1885, 1887) led to a clash between du Prel and von Hartmann, who, in an essay on somnambulism, had criticised du Prel’s transcendental individualism, as presented in his *Die Philosophie der Mystik* (von Hartmann, 1886). At the core of the dispute lay diverging opinions regarding the nature of hypothetical survival of death, which du Prel tried to show was personal, while von Hartmann, in the vein of Schopenhauer, granted survival in an abstract form only, as a merging of the mind into a monistic “world-substance”.
This period also marks a significant theoretical development in German psychical research. Du Prel, who had launched his career by publishing an astute defence of von Hartmann’s philosophy of the unconscious against a raging critic of von Hartmann’s (du Prel, 1872), eventually took sides against his former ally with the Russian Alexander Aksakoff (1832–1903), a proponent of the survival hypothesis and founder of the first German psychical research journal, *Psychische Studien*.\(^5\) In response to von Hartmann’s *Der Spiritismus* (von Hartmann, 1885), Aksakoff published two volumes containing counter-arguments to von Hartmann’s theory of hallucinations as applied to physical mediumship (Aksákow, 1890).\(^6\) When von Hartmann issued a reply to Aksakoff (von Hartmann, 1891), du Prel took over to counter his arguments (du Prel, 1891b, 1893), thus widening the chasm between von Hartmann and himself.

Du Prel also became known for his commented edition of Kant’s *Vorlesungen über Psychologie* (*Lectures on Psychology*, Kant, 1821/1889), an obscure collection of post-critical lecture notes first published 17 years after Kant’s death. Through his new edition of the *Vorlesungen*, du Prel hoped to correct the widely promulgated image of Kant as a critic of occultism in general and of Swedenborg in particular, arguing that Kant’s *Träume eines Geistersehers* (*Dreams of a Spirit-Seer*, Kant, 1766) had been misrepresented as a mere parody on Swedenborg, whereas the *Vorlesungen* contains significant passages suggesting that Kant shares crucial insights on the nature of mind with both Swedenborg and du Prel.

After publishing more books on psychical research (e.g., du Prel, 1888, 1890–91, 1894–95, 1899) and a “hypnotic-spiritistic” novel (du Prel, 1891a), Carl du Prel died on 5 August 1899 in Heiligkreuz in Tyrol. He was survived by his children, Hildegard and Gerhard, and his wife Albertine, who later edited a volume containing several of his articles that had not previously been published in book form (du Prel, 1911). Biographical research on du Prel became considerably hampered by the complete destruction of his estate during the Second World War. The most comprehensive biography and bibliography of du Prel currently available is Tomas Kaiser’s recent Ph.D. thesis (Kaiser, 2008), which also compiles a number of previously unpublished letters.

**Du Prel’s “Monistic” Model of Mind**

At the heart of du Prel’s philosophical-psychological system lies the concern that approaches which exclusively study everyday waking consciousness not only miss important potential insights for philosophy and scientific psychology, but yield false premises about the nature of mind. As a philosopher, du Prel argues that materialist, Cartesian, and idealist positions are mistaken because they are based on the phenomenology and epistemology of waking consciousness only and thus fail to take into account the enormous implications of the unconscious aspects of the mind. While applauding von Hartmann’s approach, which seeks to remedy this ailment, he criticises his pantheistic system for presupposing that the “world-substance” is directly at work in individual organisms, whereas du
Prel proposes an intermediating or underlying and co-ordinating link between the physical domain and von Hartmann’s “Unconscious” (which is similar in many respects to Schopenhauer’s “World Will”). This link du Prel calls the **transcendental subject**.

According to du Prel, the transcendental subject is the actual metaphysical individual, of which the everyday waking personality or self-consciousness is but a pragmatic phenomenological excerpt and product of biological evolution. Hence, the transcendental subject is only imperfectly illumined by self-consciousness, but is predicted to gradually emerge into the sphere of the empirical self of man in the course of evolution. The perceptual dividing line, or epistemological threshold, that is shifting in the course of biological evolution and which determines the degree and scope of sensual perception is equated with G. T. Fechner’s “psychophysical threshold”. Du Prel suggests that a shift of the threshold can already be observed and experimentally induced, for example, in somnambulism and hypnotism. The transcendental subject, of which consciousness is an activity, is the formative agent underlying anatomical and physiological processes. It is therefore both the thinking and organising principle or soul in man. Thus, du Prel proposes that the physical and mental alike can be derived from the transcendental subject as a common underlying monistic principle (du Prel, 1888).

Concerning scientific psychology, du Prel argues that it needs to study the properties of the psyche (aka the transcendental subject) in altered states of consciousness rather than the ordinary waking self alone. This approach is in contrast with the experimental psychology of Wilhelm Wundt (1832–1920), which explicitly dismisses altered states of consciousness as a subject of psychological investigation. As areas of research du Prel suggests the everyday phenomena of dreams, spontaneous somnambulism, the appreciation of time in sleep, and artistic creativity. More exotic phenomena revealing the existence of the transcendental subject include hypnotism, “magnetic” somnambulism (an altered state of consciousness induced by mesmeric passes, which du Prel holds is different from hypnotic trance), instances of exceptional memory, but also psychopathological phenomena, particularly hysteria and autoscopy. Finally, du Prel stresses the scientific importance of the study of documented anomalies such as temporary lucidity in the dying (including alleged spontaneous remission of mental health in psychiatric patients despite severe symptoms and even organic causes), apparitions (especially of the living), extra-sensory perception, xenoglossy, and physical mediumship. He seeks to establish the organising function of the soul through the study of “phantom limbs”, spontaneous and hypnotically induced vasomotor and other physiological effects, maternal impressions, materialisations, and related phenomena that seem to presuppose physiologically efficacious conscious and unconscious volition and intrinsic knowledge of the organism and its functions by its supposed producer, the transcendental subject.

Du Prel’s chief concern, however, is to show that human consciousness is capable of surviving bodily death. Echoing Immanuel Kant, who held that the
existence of God and the afterlife need to be postulated since they serve as powerful moral regulatives, du Prel suggests that a belief in survival is a necessary condition for altruistic motivation: “It could be demonstrated easily that all social diseases are associated, at their deepest roots, with a generation’s view on death. . . . In order to be good, which may be an inbred trait, the belief in immortality might be dispensable, but it is indispensable in order to become better” (du Prel 1888: 309), and he holds that “it is for morality’s sake that the belief in immortality appears desirable in the first place” (du Prel, 1899/1901: 63). He argues that since the (preexisting) transcendental subject is the producer of the body, it follows that it will be unaffected by physical death. Postmortem survival is conceived of as an epistemological rather than an ontological transformation, for “the beyond is the here and now, [only] perceived differently” (du Prel, 1899/1901: 73). A study of certain functions of the human psyche (aka transcendental subject) suggests that they are adapted to disembodied existence, just “as the embryonal formation of the retina has us infer to a life in the world in which the sun shines” (du Prel, 1888: 306), which is why du Prel, who is sceptical regarding the teachings of spiritualism and the identity claims of mediumistic communicators, proposes that “spiritism is quite dispensable for the problem of immortality; the analysis of the living is sufficient for that purpose” (du Prel, 1888: 320). However, du Prel realises that an experimental approach towards survival may aid the acceptance of survival as a scientific hypothesis. Hence he proposes to use postmortem suggestions in dying volunteers in order to induce—and thus predict—objective postmortem materialisation and activities at a given place and time (du Prel, 1894), a suggestion which understandably provoked ethical concerns (e.g., Hübbe-Schleiden, 1894).

Reception and Criticisms Within and Outside Germany

Readers familiar with the work of Frederic W. H. Myers (1843–1901) will have noted the striking similarities between du Prel’s “transcendental subject” and Myers’s “subliminal Self” (e.g., Myers, 1892, 1903). Both authors embrace an evolutionary framework for the interpretation of certain properties of the human psyche, such as creativity or extra-sensory perception, which they conceive of as latently preexisting to their biological conditions of expression. The “transcendental subject” (du Prel) and the “subliminal Self” (Myers), which both authors anticipate to gradually emerge into the empirical self in the course of biological evolution, are conceived of as the psychical entity underlying our everyday, empirical consciousness and as the bearer of psychic and psychological functions (du Prel, 1885: 61; Myers, 1889: 190). The perceptual dividing line, or epistemological threshold, that is shifting in the course of evolution and which determines the degree or scope of sensual perception is conceived of as a “membrane” by Myers and is equated with G. T. Fechner’s “psychophysical threshold” by du Prel (however, Myers sometimes also uses the term “psychophysical threshold”, e.g., Myers, 1891: 83). Moreover, in regard to the problem of survival, it is obvious that
du Prel also followed what Alan Gauld (2007) calls a “broad canvas” approach: i.e., rather than through a discussion of the evidence directly suggestive of survival alone, both he and Myers developed a view of human personality whose capacity of postmortem survival has a certain *a priori* plausibility. Since du Prel did not read English (Kaiser, 2008) and published his key ideas prior to Myers (who did read German), it is likely that the hypothesised influence was largely unidirectional.10

Initially, du Prel’s work was received with great enthusiasm by most fellow German psychical researchers as well as by his British colleagues at the SPR, but criticisms were raised increasingly. Albert von Schrenck-Notzing, for example, parted ways with his former teacher because he deemed him to be too uncritical and lacking a sufficiently scientific attitude (Schrenck-Notzing, 1932). Du Prel’s somewhat arbitrary terminology did not aid his search for academic recognition either. For instance, he used the word “mystic” as an umbrella term to describe phenomena and processes that bear no relation to actual mystical experience, and which might have been better referred to as “psychic”, or “supernormal”. In fact, *Sphinx* editor Hübbe-Schleiden once had to apologise to readers, some of whom had written letters of complaint about du Prel’s indiscriminative use of the “M word” (Hübbe-Schleiden, 1889).

Occasionally, du Prel conducted or participated in experiments, investigating physical mediums like the German Elisabeth Tambke in Munich (du Prel, 1894/1916), the Briton William Eglington in Vienna (du Prel, 1886), and together with Charles Richet, Cesare Lombroso and others, the Italian Eusapia Palladino in Milan (du Prel, 1892, 1893). However, his philosophical speculations were based mainly on outdated and rather anecdotal evidence, such as the phenomena reported (but poorly documented) by adherents and practitioners of mesmerism. This was a major criticism raised by Oxford philosopher Ferdinand Schiller (1894) and William James (1894), both of whom wondered why du Prel did not focus on contemporary data, particularly the empirical material collected and presented by the SPR. In part, the answer is of course that du Prel, who was fluent in French but did not know English, could not cite literature he was unable to read.

Regarding the attribute “monistic”, as applied by du Prel to his philosophical system, it has to be argued that his theory can pass as a psychological monism at best, as it presupposes at least a phenomenological mind-body dualism and is rather vague about the ontology of the “astral body”, a concept which du Prel increasingly comes to embrace, and about whose nature and relationship to the transcendental subject he is somewhat inconsistent (compare, e.g., du Prel, 1888 and 1899).

**Conclusion**

Despite these criticisms Carl du Prel has to be remembered as an important author whose work has stimulated several eminent intellectual figures and which
may inspire fascinating avenues of research even today. As a philosopher, he raised the importance of the individual unconscious for the philosophy of mind, which up to the present day usually ignores the enormous implications of unconscious and dissociative processes for a scientific theory of the mental. Moral philosophy can receive valuable stimulation from du Prel’s arguments on the importance of the scientific evidence for survival as a potential motivating factor for altruistic behaviour. For Kant scholars, his edition of Kant’s Vorlesungen remains a hitherto largely unexplored field of historical and conceptual research. The increasing interest in Myers’s subliminal psychology in a historical context (e.g., Crabtree, 1993; Ellenberger, 1970; Koutstaal, 1992) and the recent critical appreciation of his work in the light of current data (Kelly et al., 2007) justifies the question regarding the striking similarities in Myers’s and du Prel’s concepts. From a perspective of the history of science, the case of Carl du Prel is an instructive example for the importance of psychical research and some of its proponents in the making of late 19th century psychology (see also Kohls & Sommer, 2006). Finally, du Prel’s thoughts on the importance of alleged apparitions of the living, the phenomenology of autoscopy, and reported cases of lucidity and anomalous restoration of normal mental functioning in mentally impaired patients shortly before death, and other now forgotten phenomena, might stimulate a new interest in potentially still-promising areas of research for neuroscience, psychology and anomalistics.

Notes

1 From A. A. Brill’s 1913 translation of Freud’s Die Traumdeutung (The Interpretation of Dreams), published by Macmillan (New York). All other translations from the German are mine.

2 Biographical details are mainly taken from Kiesewetter (1891), Tischner (1960), and Kaiser (2008).

3 In absentia means that a Ph.D. is being awarded based on the submission of a thesis only, with the candidate not being required to be enrolled at the awarding university.

4 Die Philosophie der Mystik was the only work of du Prel to appear in an English edition and was translated in two volumes by Frederic Myers’s friend C. C. Massey, published in 1889 by Redway (London).

5 The journal was launched by Aksakoff in 1874 and continued as Zeitschrift für Parapsychoologie from 1926 to 1934. Aksakoff’s name was spelled inconsistently in the German publications, “Aksákow” being the most common version.

6 In Animismus und Spiritismus, which was compiled from a series of articles previously published in Psychische Studien, Aksakoff proposes three terms describing in his view distinctive categories of phenomena observed in psychical research: Personismus (“personism”, pertaining to phenomena appearing as if caused by discarnate spirits involving no supernormal information or effect, merely stemming from a medium’s or percipient’s intra-personal unconscious dramatization, as, for example, in most instances of automatic writing); Animismus (“animism”, describing phenomena appearing as if caused by discarnate spirits, but emerging from unconscious dramatization plus involving psi among the living); and Spiritismus (“spiritism”, delineating phenomena
appearing as if caused by discarnate spirits and suggesting actual postmortem authorship). Aksakoff’s tripartite account of psychic phenomena has been used in German language parapsychology up to recent times (see, e.g., Mulacz, 1976).

7 In contrast to out-of-body experiences, autoscopic experiences present the focus of perception as remaining “in” the body, while an external double of oneself is hallucinated.

8 Du Prel fails to distinguish between survival, which is not necessarily eternal, and immortality proper.

9 This implies that du Prel ascribes to the brain the role of an organ limiting rather than producing consciousness.

10 I am currently investigating the potential influence of du Prel on Frederic Myers.

Acknowledgments

I wish to thank Siobhan Lynch, Trevor Hamilton, Carlos Alvarado, and Eberhard Bauer for providing feedback on an earlier draft of the manuscript.

References


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HISTORICAL PERSPECTIVE

A Brief History of Abduction Research

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Abstract—UFO abductions have been a part of the UFO phenomenon since the early years of public awareness of sightings. Although academics and scientists began to study UFO abduction, over the years cultural events and non-evidence-based theories provided barriers to academic and scientific inquiry into it. In spite of the lack of academic interest, the phenomenon continues unabated and unaffected by societal events.

Keywords: abductions—academics—research

It did not take long for UFO researchers to learn about the abduction phenomenon. UFO sightings came to public attention in 1947, and by 1953 there were already puzzling aspects of some sightings that researchers could not comprehend. In Florida, a Boy Scouts scoutmaster, Sonny Desvergers, claimed that he had seen a flying saucer from close up while standing underneath it. He said a ball of light came from it and he lost consciousness. He woke up 45 minutes or so later and he noticed that he was in a different area than when he became unconscious. His narrative of what happened to him was somewhat jumbled, and he even alluded to seeing creatures, but he did not elaborate.

With present-day knowledge, abduction researchers might see Desvergers’ description and difficulty recounting his experience as signals that this case needed serious investigation. There were many like this before researchers could understand what was happening. Thus, the abduction phenomenon could easily have been couched in sighting cases from the beginning. In 1953, however, the Air Force judged the case to be a hoax, although the investigators could not figure out how he burned the roots of the grass and not the tops at the sighting scene.1

In 1957, Brazilian law student Antonio Villas Boas provided the first account of an abduction. He said that creatures from a UFO forcibly took him into their craft and forced him to undergo a series of physical procedures that included the taking of blood. Afterwards, a strange looking female who looked half-human and half-creature forced him to have sex with her twice. The second time his sperm was collected in a receptacle. When she left, she pointed to her midsection and then up presumably towards the sky. After he was let out, his sense of the situation was that they were using him as a “stallion” to improve their stock. Most members
of the UFO research community thought this was an outlandish and embarrassing story. Although it took place in 1957, it did not appear in print until 1962. Few researchers gave it credence.²

Four years after the Villas Boas case, the famed Barney and Betty Hill abduction took place. The Hills claimed that aliens abducted them from their car into a UFO. When they were returned, they promptly forgot nearly everything that had happened. The couple seemed to be missing 2 hours of time on a trip down Highway 1 in New Hampshire as they drove home. Anxiety over the missing time and strange dreams led them to the noted psychiatrist and hypnotist Benjamin Simon, who retrieved their memories with hypnosis. Their accounts described not only a physical examination, but also alien interest in reproduction; the abductors took a sperm sample from Barney and gave Betty what she thought was a “pregnancy test.”

The Hills were a serious couple. They did not resemble the infamous 1950s “contactees” who claimed ongoing contact with Space Brothers and who went on trips in UFOs, sometimes to other planets. UFO researchers had fought them in the 1950s and did not want another round of new contactee battles. In 1966 the publication of a book about the Hills’ story began the public’s fascination with abductions, but UFO researchers were not so enthusiastic. The specter of the contactees and the possibility that deluded people were psychologically generating these accounts was too great.³

During the next few years, a few more abduction cases began to be uncovered. But understanding what was actually happening proved to be far more difficult than analyzing UFO sightings. People understood that strange things had happened to them, but they were at a loss to explain them or even remember what they were. Using the Simon model, a few researchers attempted hypnosis, but the results, while suggestive of something unusual happening, were not consistent with each other except in broad terms of being taken and given examinations.

By the 1970s, while researchers were becoming aware of abductions, two incidents generated national publicity that helped make the subject familiar to most Americans: the Pascagoula and the Travis Walton abductions. In Pascagoula, Mississippi, in October 1973, Calvin Parker and Charles Hickson claimed that they were taken on board a UFO and examined, but that was all they could remember. The venerable UFO investigator J. Allen Hynek and University of California–Berkeley engineering professor James Harder came to Mississippi to investigate. Harder tried hypnosis on the traumatized Hickson, but his attempt was unsuccessful. Nevertheless, the case made national news. No evidence of a hoax turned up.⁴

The heavily publicized 1975 Travis Walton case spanned 5 days of missing time. He consciously remembered about 20 minutes of what happened to him, but like the Pascagoula case, more information was not forthcoming. Also in 1975, NBC showed a TV movie about the Hill case, The UFO Incident. Millions of people saw a serious rendition of an abduction event. By the end of the 1970s, the media began to pay more attention to the phenomenon. UFO researchers were
also becoming more interested in it because the accounts were increasing from reputable people, even though they should not have been because by their very nature they cast aspersions upon the claimants’ mental stability.

Soon other cases came forward and researchers struggled to deal with them. University of Wyoming psychology professor Leo Sprinkle learned hypnosis and began to look into cases while Harder continued his research. Independent researchers like Raymond Fowler and Ann Druffel wrote investigative books about people’s experiences. Researchers Jim and Coral Lorenzen publicized abduction accounts in their books and articles. Folklorist Thomas E. Bullard scrutinized abduction accounts for folklore influence and for patterns. University of Connecticut psychology professor Kenneth Ring tried to place the phenomenon within more common paradigms like near death experiences.

By the end of the 1970s, three basic assumptions had emerged—abductions were random adult-onset single events, the abductors’ intent seemed to be to study humans, and people were making contact with extraterrestrials. Other patterns were slow in coming. People described similar events but memory problems prevented full and accurate expositions. Although abductions were gradually becoming a significant force in UFO study, most researchers were still convinced that they were psychological in origin.

In the late 1970s, the famed artist Budd Hopkins became interested in abductions after publishing an analysis of a UFO and “occupant” sighting that had happened to an acquaintance across the street from his New York City home. Hopkins’ article provoked a large number of letters about people’s unusual experiences. He recognized the abduction material and began the process of comparing abductees’ accounts and searching for similarities. With a psychologist doing the hypnosis, Hopkins found that the seven abductees with whom he had worked all had unusual scars, they could be abducted more than once, and they had odd masking memories of animals and other figures that were hidden abduction memories. He confirmed and elaborated upon the examinations of abductees. The book provided what UFO researchers had been looking for—detailed, matching, non-idiosyncratic accounts.

Hopkins’ 1981 book *Missing Time* was a milestone in abduction research and it began to draw the serious attention of other researchers. Hopkins opened a window on the phenomenon and he proved that others could do the same. In 1982 I became one of the UFO researchers who began to look through that window. By 1986 I was doing hypnosis with abductees to find out for myself what the abduction phenomenon was. I quickly discovered that hypnosis was not an easy tool to use. It required knowledge of the problems and pitfalls of false memories, confabulation, and other unforeseen problems specific to abduction memories. After making mistakes, I felt my way around in it very gingerly for the next few years.

In the meantime, Hopkins continued his research, and in 1987 he published *Intruders*. In this best-selling book he followed a family beset by abductions and uncovered accounts of fetuses implanted in women and removed weeks later.
He found babies and toddlers that appeared to have physical and mental elements of both humans and aliens. He called them “hybrids.” He found that people were abducted more than one time, ending the theory of random adult-onset single events. His investigation into families of abductees suggested that the phenomenon might be intergenerational. He uncovered the depth of trauma on some abductees that suggested physical and not psychological causation. He was beginning to flesh out the phenomenon as never before.

At the same time Intruders came out, writer Whitley Strieber published his immensely popular Communion. The book was a sensational New York Times best-seller. Although Intruders was far more meaningful in its uncovering and analysis of abduction patterns and activities, the Strieber book was famous not only because of its personal story, but for its cover’s fanciful (and incorrect) close-up illustration of an alien’s head. Many individuals looked at the alien’s peering eyes and inexplicably lapsed into panic. A torrent of people began to question why the cover had seemingly irrationally scared them. Furthermore, many were at a loss to explain why they in some way knew that the alien’s head shape was wrong. Investigation into some of those whom the book frightened revealed a history of abduction activity. In effect, the response to Strieber’s cover art seemed to confirm Hopkins’ discovery of ubiquitous hidden abductions.

The success of both books prompted a rash of television shows about the subject and suddenly the phenomenon emerged as a reliable popular culture revenue generator. Eventually, the figure of an alien (not necessarily Strieber’s) became a cultural icon used by advertising agencies to sell a wide range of products from cars to computers to candy.

As media interest grew, so did the numbers of abduction researchers. Licensed hypnotherapists such as Yvonne Smith, licensed clinical social workers such as John Carpenter, NASA psychologist Richard Haines, and University of North Texas English professor Karla Turner all began to investigate abductions through hypnosis. While many abduction researchers were competent and conscientious, many others were new to the field and were anxious to place the phenomenon into well-known spiritual, religious, and New Age contexts. Hypnosis offered an easy opportunity to do this. Some of the more naïve researchers began to tie abduction phenomena to angels, devils, the Bible, past lives, and even future lives. Many, but not all, of these investigators strongly required and often received the agreement they sought from the sometimes vulnerable abductees undergoing hypnosis.

Serious researchers realized that competency in both the techniques and pitfalls of hypnosis and knowledge of the abduction phenomenon was optimum for confirmable data. More commonly, however, amateur researchers with personal agendas began to do hypnosis of abductees. As a result, the evidence obtained tended to mirror the incompetent hypnotist’s agenda. Furthermore, “channeled” information has been used to suggest that abductions are amenable to someone communicating with aliens through one’s mind and then asking questions and receiving answers. The information generated has not proven to be worthwhile even though there might be a “hit” or two out of the enormous mass of channeled
material generated over the decades. Unfortunately, neither the media nor the academic community could distinguish between these researchers and the competent ones. The exploration of abductions was becoming less rather than more rigorous for many investigators.

The 1990s started with the publication of a 1991 Roper poll and with the introduction of John Mack into the debate. The random sampling of almost 6000 people showed that the number of Americans who had abduction-like experiences was far greater than anyone had ever imagined. The poll indicated that they had seen spirits, religious figures, and ghosts, and had other experiences that many abductees had claimed before investigating their memories. These events often resolved into abduction cases when the claimants recalled the events with hypnosis. Hopkins and I estimated that, although it was impossible to know without individual investigation, as many as 2% of the American public might have had abduction experiences. A few researchers criticized the survey on methodological grounds, but regardless of the poll numbers, thousands of purported abductees had already directly contacted investigators, indicating that there were a substantial number of people in the country who felt this phenomenon had happened to them.

John Mack became interested in the subject after attending a 1990 lecture by Budd Hopkins. A noted Harvard professor of psychiatry and a Pulitzer Prize winner, Mack immediately understood that abductee accounts did not match any conventional psychological models. Having studied theories of transformational consciousness with Stanislav Grof, he felt that perhaps the phenomenon abutted theories about the place of consciousness in the universe. Although he found the same procedures that other researchers found, his two books, *Abduction* (1994) and *Passport to the Cosmos* (1999), espoused the idea that Western Science was not equipped to account for a phenomenon that spanned both the experiential and the spiritual worlds. Eventually, he became more interested in transformational studies, and he ended his abduction research a few years before his death in 2004.

Mack’s Harvard affiliation helped the abduction phenomenon get more attention. Unfortunately, he also got attention as a Harvard committee convened to investigate his research. Although this unprecedented committee found no improprieties, it questioned his methodology. The well-publicized affair showed that working in the UFO and abduction field within the confines of academia could be a very risky endeavor. With no university or institutional funding for research into the subject, nearly all researchers did their work with their own money and time.

My own research resulted in my books, *Secret Life* (1992) and *The Threat* (1998). I was able to develop information about the complex neurological manipulations involved with carrying out abductions and the procedures used on abductees. I studied the function of secrecy and the role of hybrids in the program. The babies that Hopkins had discovered were growing into adults and they seemed to have increasingly complex functions within the abduction scenario. In spite of
commonly held belief, the evidence for abductions being an experiment or a study of humans did not materialize. Rather, the evidence pointed to a systematic program with a beginning, a middle, and an end. It seemed to be goal-directed, and abductees indicated that they were possibly being trained for future events. More importantly, for serious researchers it was increasingly evident that the phenomenon had a life of its own completely unrelated to the abductees’ lives or to the society.12

In the meantime, abductees were coming forward in ever-growing numbers. Thousands of people were contacting researchers and telling them of abduction-related experiences; non-alcohol, drug, or brain disorder–related missing time, memories of lying on a table in a gray circular room, awakening in the morning wearing their clothes inside out or wearing an unknown person’s clothes. They lived in “haunted houses” no matter where they moved. They saw deceased relatives and religious figures; they talked to owls, raccoons, deer, and other large-eyed animals. They found themselves driving on a highway and suddenly it was 2 hours later and they were still in the car driving on the same spot they had been before.

These experiences were bolstered by researchers’ rising knowledge of the physicality of abductions. They found that when abducted, people were physically missing from their normal environments. When they were returned, they often had physical anomalies including fully-formed scars, bruises, and other sequelae that were nonexistent before the event. They were often abducted in groups. They could verify each other’s abduction accounts. The repeated precision of the detail dovetailed exactly with other accounts even when those accounts had never been publicized. Furthermore, the randomness of abduction claimants spread across all socio-economic, intellectual, educational, racial, religious, geographic, political, and gender lines. Ph.D.’s, M.D.’s, L.L.D.’s, academics, scientists, business people, and other high functioning individuals told of the same events as did high school and middle school dropouts, some of whom could not hold a job. Researchers were now realizing that the original cases of Villas Boas and the Hills were reflective of a consistent narrative that had continued for over half a century.

By the end of the 20th century other researchers began to specialize in certain aspects of abductions and make suggestive discoveries. Roger Leir, a doctor of podiatry in Los Angeles, began a program of removing what abductees thought were implants from their bodies. Australian investigator Bill Chalker searched for forensic evidence of alien abductions. Although ridiculed by other researchers, Michael Menkin began experimenting with head covering devices that might prevent individual abductions. Those who used them reported positive results. More importantly, abduction researchers using hypnosis properly were building a depth of knowledge of the subject unlike any other scientifically fringe phenomenon in modern times.13

In spite of the gains made in understanding abductions, the scientific and academic community never deviated from the assumption that the phenomenon
was psychologically generated. Lay and academic explanations for the phenomenon ranged from celebrity-seeking to fears of the new millennium, to sleep paralysis, to any number of bizarre and familiar human fears, desires, and influences. To the extreme frustration of abduction researchers, all of the more than 30 published explanations exhibited a lack of knowledge of the evidence, a disregarding of the evidence, and/or a distortion of the evidence. Not a single explanation took into the account the totality of the abduction evidence. Very few in the academic field, with notable exceptions like SUNY Brockport psychology professor Stuart Appelle, Hobart and William Smith University political science professor Jodi Dean, and a few others, could think even neutrally about the subject.

The academic community seemed secure in its outlook because of the charlatans and hoaxers who came forward with information about aliens coming here to spread the word of God, or to protect us from bad aliens, or to help us ascend to a higher state of consciousness. Some of the more egregious characters claimed to have been named ambassadors to the aliens who have their own interplanetary governmental structure. Conspiracy theorists claimed that the U.S. government was behind all the abductions. The media did not help much by broadcasting shows like the dubious *Alien Autopsy*. All this placed the subject squarely in the middle of a less than savory science fiction classification. Most academics, rather than even examining the idea that the phenomenon was anomalous, resorted to the Space-is-Big-You-Can’t-Get-Here-From-There argument and then dismissed it all. Other academics insisted on pursuing the psychologically-based arguments that made abduction cultural artifacts. Their theories did not reflect any previous research into or substantive knowledge about the subject. In the face of the obstacles, a few academics quietly researched the abduction phenomenon. Psychology professors Don Donderi at McGill University and Stuart Appelle, working with researchers Budd Hopkins and Ted Davis, were exploring more systematic ways to evaluate abductee accounts through questionnaires.

By 2008, the outlook for any widespread scientific or academic involvement with the abduction phenomenon seemed as implausible as the phenomenon itself. For UFO researchers, scientists’ retreat from studying abductions extended now to the ubiquitous UFO sightings. For them, scientists’ attitudes could be best understood using ostrich and sand analogies. Independent researchers, along with a few academics, were carrying on research into the subject without the aid of institutional funding, academic backing, and scientific curiosity or even passing interest by other academics. In fact, hostility had replaced the mild interest shown in past decades. The layering of New Age theories, channeled information, government conspiracy theories, popular culture, hypnosis as a research instrument, the fallibility of memory, and the seeming scientific implausibility of UFO abductions buried the phenomenon virtually out of reach of academic interest and created resistance, disinterest, and even hostility among academic professionals. This hostility made it difficult, if not impossible, for scholars and scientists to study the situation within the context of normal academic activities, even in the unlikely
event that they wanted to. That lack of academic or institutional support not only prevented research into the subject, it added to the presumed illegitimacy of it. If academics were not studying it, it must be unworthy of attention, thus there is no need for academics to study it. Abductions were caught in a perfect cultural storm—a storm that had no effect on the narratives given by competently investigated claimants.

In 2000, I edited a collection of articles about UFOs and abductions that included 10 serious researchers. Published by the University Press of Kansas, it was aimed at showing the academic community that the UFO and abduction phenomenon had substance and was amenable to rational inquiry devoid of cultural infusion. I and others involved with the project were hopeful that the publication of the university press book would stimulate interest in the subject. It did not.15

But indications were that this fringe-of-the-fringe, unlikely, improbable, implausible, dubious, and unbelievable phenomenon was, in all likelihood, not going to go away. It had continued for quite a long time and it exhibited no decrease in the number of abductees and there was evidence that they were increasing. The abduction phenomenon appeared to have an internal integrity that was logical, complex, and assertive. It was global, cross cultural, and devoid of personal idiosyncratic aspects that would make it obviously psychologically generated. It was not amenable to easy answers, and no matter how hard researchers tried, they could not find internally generated causative factors for it. The lack of a viable psychological theory about abductions that takes into account all the evidence is the anomaly that, in a Kuhnian sense, continues to challenge the prevailing paradigm of what is possible, what is occurring, and what could not possibly be. By 2009 the academic community was further away from resolving this anomaly than ever before.

References


ESSAY

In Defense of Intuition: Exploring the Physical Foundations of Spontaneous Apprehension

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Abstract—The thesis advanced in this paper is that human experience encompasses not only elements registered by the exteroceptive and interoceptive senses, but also elements received intuitively, in a direct and spontaneous mode. Findings at the cutting edge of quantum physics and brain research support the hypothesis that the brain can receive information not only through nerve-signals conducted from the senses but also through quantum resonance at the level of cytoskeletal structures. Confirmation of this hypothesis would provide a physical foundation for the spontaneous intuitions that surface occasionally in consciousness. Recognizing that some varieties of intuitions are bona fide perceptions of the world beyond the brain and body would enlarge our view of the scope of human experience and support assumptions about the existence of subtle informational ties between humans, as well as between humans and nature.

Keywords: apprehension—intuition—information—nonlocality—quantum physics—quantum brain theory

Spontaneous apprehensions appear to be perceptions of the world beyond the range of the exteroceptive senses. Such perceptions are generally considered extrasensory. However, we can avoid long-standing and mostly fruitless debates on the reality of ESP by reserving the term “perception” for ordinary sensory perception and denoting the spontaneous mode of human experience with the term “apprehension” (in the sense defined by Webster’s: “the faculty or act of apprehending, esp. intuitive understanding; perception on a direct and immediate level”). The distinction is important inasmuch as sensory perception tends to be relatively distinct and articulate, whereas spontaneous apprehensions are generally more diffuse, reaching consciousness in the form of vague if often meaningful intuitions.

In the reductionist-materialist culture inspired by classical science, spontaneous apprehensions are dismissed as hallucinations or fantasy. Classical empiricism claims that there can be nothing in the mind that was not first in the eye. However, this tenet, although widely accepted in the West, is exceptional in the annals of history and even in the spectrum of contemporary cultures.
Traditional people accepted intuitions as conveying real and meaningful information about the world. Shamans and medicine-men (and women) tuned themselves to spontaneous apprehensions through rigorous initiation and training; they believed that they derived power and vision through these apprehensions. In history spontaneous apprehensions were embedded in the conceptual framework through which a given culture interpreted the nature of reality. In mythical cultures the world was seen as a cosmic realm of spirits; in classical cultures, as overseen by a panoply of unseen but real gods. The Abrahamic monotheistic religions recognized the intuitions of their prophets as conveying fundamental truths about God and the nature of all creation. Oriental cultures have never limited their concept of reality to information conveyed by the senses.

The modern mentality of the Western and Westernized world takes as real only that which is manifest—literally “to hand.” Because what modern people see is constrained by what they believe they can see, everything that is not conveyed to consciousness by eye and ear is dismissed from the modern view of the world. Elements of consciousness that originate beyond the range of the senses are dismissed as fantasy, or relegated to the subconscious domains of the psyche. They are recognized as meaningful only in the subjective context, and are ascribed interpersonal significance merely in the case of artists, poets, prophets, and mystics.

But are spontaneous apprehensions of the world merely subjective, lacking objective reality? Or could the intuitions that make up the woof and warp of artistic, religious, and sometimes even scientific creativity find realistic explanation in the context of contemporary science?

**Toward a Physics of Spontaneous Apprehension**¹

Sensory perception is limited to the visible range of the electromagnetic spectrum, the audible range of sound, and the place and time of the corresponding EM and air waves. Spontaneous apprehensions, on the other hand, seem to embrace information originating beyond the sense-perceivable range and transcend the classical limitations of information-transmission in space and time. Thus modern science has difficulty explaining how spontaneous apprehensions could have physical reality. There are, however, findings at the cutting-edge of contemporary scientific research that open fresh perspectives. They speak to the possibility that space- and time-transcending transfers of information are physically possible not only among quanta (where they constitute the phenomenon of nonlocality), but also among human brains, and between human brains and nature.

**Information in Nature**

Spontaneous apprehensions seem to convey information on the world beyond the subject regardless of time and distance. The first question we shall consider is whether it is permissible to speak of information in the world in general, and not only of information in the human sphere.
In classical science, the assertion that information exists objectively in the world would have been considered a metaphysical proposition. This is no longer the case. It is now recognized that information is present throughout nature; as John Wheeler remarked, in some respects it is the most fundamental aspect. Already quanta behave in a curiously informed manner, appearing to make choices of their own, and responding to choices by other quanta. Either quanta have a form of consciousness of their own (a thesis entertained by some physicists), or they are embedded in a complex informational environment.

Atoms, molecules, and other physical (and not only biological and biopsychological) entities embody information; it is what distinguishes one object or system from another. The information emitted by material (i.e. massive-particle based) objects is present in the radiation emitted by them and maps their physical properties. The information is present and measurable even in the absence of the objects that produced them (Citro, in preparation; Fraser & Massey, 2008); it is information carried and conserved in space. Thus space is not merely the passive backdrop of the concourse of material entities as in Newtonian physics, but an active matrix interacting with the material entities that occupy space-time.

Since the advent of general relativity the above proposition has been accepted knowledge. In a paper published in 1930 Einstein himself noted, “We have now come to the conclusion that space is the primary thing and matter only secondary; we may say that space, in revenge for its former inferior position, is now eating up matter.” (cited in Wolf & Haselhurst, 2005) A few years later Erwin Schrödinger restated the same concept. “What we observe as material bodies and forces are nothing but shapes and variations in the structure of space.” (Schrödinger, 1989).

In recent years a number of physical fields and forces have been ascribed to the interactive matrix that replaced the concept of passive space. In grand-unified and super-grand-unified theories all universal fields and forces are traced to origins in the quantum vacuum, a ceaselessly fluctuating sea of emerging and vanishing virtual particles. The quantum vacuum is also the locus of zero-point energies (energies that remain present when at the absolute zero of temperature conventional forms of energy vanish). The quantum vacuum appears to be a fundamental dimension of the physical universe.

The concept of a complex field that pervades cosmic space offers a logical basis for locating information in nature. According to a hypothesis this writer stated in detail elsewhere (Laszlo, 2004, 2006, 2008), the fundamental physical domain known as the unified field carries not only the universal fields and zero-point energies, but also information. The presence of material objects excites the ground state of the field and deforms it, thus creating a form of information. The radiation emitted by the objects propagates in the form of expanding wavefronts, and this, too, is information in the field. When two or more wavefronts meet, they produce an interference pattern. The patterns are analogous to the interference of light beams in ordinary holograms. Holograms carry information at their nodes on the entities and events that created the waves that make up the interference pattern. However, the interference patterns created by material objects through the
excitation of the fundamental physical dimension known as the unified field are not ordinary, but quantum holograms. They carry information on the events that created them in the quantum domain.

The question is, whether some elements of the information carried at the nodes of interference patterns in the unified field could be accessed by human brains. In light of recent work at the frontiers of quantum physics, quantum biology, and quantum brain research, the answer appears to be yes: a spontaneous access seems physically possible.

Quantum Receptivity in the Brain

The crucial finding supporting the above assessment is the discovery that the brain is not merely a classical biochemical system; in some respects it is a “macroscopic quantum system.” Certain critical cerebral functions involve processes previously thought to be limited to the domain of the quantum.

The pertinent functions regard the reception and transmission of information at the cellular and subcellular level, communication in the most basic and elementary sense. Intercellular communication involves quantum effects and processes. Neurons and neuronal and subneuronal networks form synchronized oscillators that receive and send information through quantum resonance. This information propagates quasi-instantly throughout the living organism and does not require classical channels of signal transmission.

The various forms and characteristics of information transmitted through quantum resonance are not fully understood, but their physical basis is clear. It is nonlocality: the correlation of quanta beyond the classical limits of space and time.

Nonlocality is a well-researched phenomenon. Laboratory experiments designed to test the EPR hypothesis demonstrated that quanta which had at any time occupied the same quantum state remain correlated across finite times and distances. To some extent, such correlation—Erwin Schrödinger termed it “entanglement”—applies to every quantum throughout space and time.

Entanglement requires that quanta be in coherent states. In fact, only interaction in some form (measurement, and possibly certain acts of observation) renders quanta decoherent. However, macroscale objects can exhibit forms of quantum coherence as well. Since the turn of the century there has been experimental evidence that the state of entire atoms can be entangled, and in recent years quantum-correlations have been discovered also at the scale of living organisms.

It appears that the heat of living organisms—even of warm-blooded organisms—does not necessarily destroy the coherence which is a precondition of quantum entanglement. While classical quantum theory maintained that at ordinary temperatures Brownian movement makes quanta decoherent and thus incapable of entanglement, recent research (inter alia by Frecska & Luna, 2006; Kitaev, 1997; Pitkanen, 2006) suggests that the problem of “heat-decoherence” is not insuperable. There can be specifically organized networks of quantum particles—for example, networks where the particles are “woven” or “braided”—that are sufficiently robust to maintain quantum coherence at body temperatures.
Whereas at such temperatures classically organized quantum elements, so-called “qubits,” become decoherent, networks of woven or braided qubits can conserve their coherence. As Parsons put it, “braiding is robust: just as a passing gust of wind may ruffle your shoelaces but won’t untie them, data stored on a quantum braid can survive all kinds of disturbance” (Parsons, 2004).

Quantum effects in the living realm are not mere theory—they are essential for coordinating the processes that make life possible. The staggering number of physical and chemical reactions taking place in the living organism is not likely to be coordinated by limited and relatively slow biochemical signal-transmission alone. Only the “entanglement” of cellular and subcellular components can ensure a sufficiently rapid flow of multidimensional information to maintain the organism in its physically improbable state far from thermal and chemical equilibrium.

The cerebral structures responsible for the reception, computation, and transmission of quantum-resonance–based information are becoming better known: they are cytoskeletal structures. Throughout the cells of the organism cytoskeletal proteins are organized into networks of microtubules, and the elements of these networks are connected to each other structurally by protein-links and functionally by gap junctions.

Microtubules form complex networks in the brain. The brain has vastly more microtubules than neurons: approximately $10^{18}$ microtubules and $10^{11}$ neurons. However, microtubules may still be too coarse-grained to perform quantum-computation. According to Stuart Hameroff (1996), the “infoplasm” is the microtrabecular lattice, a web of microfilaments 7 to 9 nanometers in diameter. This lattice is the current microfrontier, the “ground floor” of the organization of living material (Frecska, 2008). The periodic lattice of microtubules forms a network within the network of neurons, and the microtrabecular lattice is a network embedded within the network of microtubules. The microtrabecular lattice is the most likely structure to perform quantum-resonance–based operations in the brain (Hameroff, 1996; Penrose, 1996).

In view of these considerations, Frecska proposed that there are two fundamental modes of perceiving the world rather than one: the “direct-intuitive-nonlocal” mode, and the classical “perceptual-cognitive-symbolic” mode. In this writer’s view the direct-intuitive-nonlocal mode involves communication between microlattices in the brain and holographic interference patterns in the vacuum. Apprehension occurs when the frequencies are synchronous: then the quantum-level lattices resonate with the corresponding quantum holograms. In phase-conjugate resonance information is transferred from quantum holograms to the brain.

Walter Schempp has shown that quantum holograms are coherent, are mutually entangled, and carry nonlocal information on the entities that emitted the constituent wavefronts. He has also shown that the brain’s object imagery is phase conjugate. Lending support to Karl Pribram’s “holonomic brain theory” (Pribram, 1991), Schempp affirmed that “the conditions which make quantum holography possible are ideally suited to the hypothesis that the brain works . . . by quantum holography” (Schempp, 1997).
The Transpersonal Dimension of Nonlocal Information-Transfer

A transfer of information through phase-conjugate quantum resonance allows discrete individuals to experience nonlocal, so-called transpersonal communication. A series of experiments by Italian brain researcher Nitamo Montecucco showed that the brain-function of an entire group of subjects can become spontaneously correlated. In deep meditation the electrical activity of the left and right frontal hemispheres becomes synchronized. When several individuals meditate together, the electroencephalograph (EEG) wave-patterns of the left and right brain hemisphere become synchronized in the entire group. In repeated tests up to 12 meditators achieved a 50 to 70 percent synchronization of their EEG patterns without sensory contact (Montecucco, 2000).

It appears that in transpersonal communication conscious intention can produce specific effects. This seems to be the case in the practice of natural healers. Some healers perform remote healing: when they focus their consciousness on the patient, he or she may be beyond the ordinary sensory range without affecting the efficacy of the healing. The healers intentionally “send” what they call healing energy to the patient, and the latter’s brain and organism respond. Phase-conjugate quantum resonance between the brain of the healer and the brain of the healee can account for the healing effect.

The effectiveness of remote healing has been confirmed in hundreds of experiments, and its physical reality has been demonstrated in experiments that measure various facets of activity in the brain of the healer and the healee. A rigorously monitored experiment in the presence of this writer demonstrated that the electrical activity pattern in the healer’s brain is reproduced in the brain of the healee (Sági, 2003). The pattern, in the alpha and delta region of the EEG wavespectrum, transfers precisely, with a delay of just under 3 seconds. This is noteworthy, as normally the alpha and delta regions show activity only in a highly relaxed meditative state or in deep sleep. It appears that entering altered states of consciousness facilitates the transpersonal transfer of information.

Transpersonal information-transfer has been demonstrated also by tests with functional magnetic resonance imaging (MRI). In an experiment carried out by Jeanne Achterberg and colleagues, 11 healers selected test subjects with whom they felt a bonded or empathic connection and placed them in an MRI scanner isolated from sensory contact. The healers sent energy, prayer, or good intentions—“distant intentionality”—at intervals that were random and unknown to the recipients. Significant differences between the “send” and “no send” (control) periods were found in the activity of the anterior and middle cingulate areas, precuneus, and frontal areas in the recipients’ brains. The probability of the difference was calculated at $p = 0.000127$, that is, approximately one chance in 10,000 (Achterberg et al., 2005).

An impressive number of controlled experiments has shown that love, empathy, and profound goodwill increase the level and frequency of transpersonal information transfer (Benor, 2000; Grinberg-Zylberbaum et al., 1993). Jointly entering deep meditation has a similar effect: in experiments witnessed by this writer 12
persons in a deep meditative state achieved more than 90% synchronization of their EEG waves without sensory contact.

Conclusions

Spontaneous apprehension, the direct-intuitive-nonlocal mode of perception, appears physically real and experimentally demonstrable. Yet it is not the subject of sustained scientific research. The materialist-reductionist paradigm of mainstream science discourages attempts to investigate spontaneous apprehensions: they are \textit{prima facie} implausible, if not categorically impossible. Scientists who are convinced that perception beyond the range of the senses does not, or is not likely to, exist are reluctant to investigate the pertinent phenomena. For the most part they content themselves with assuming that evidence for such perception is illusory, or at best anecdotal.

Yet sustained research on the spontaneous nonlocal mode of apprehending the world beyond the brain and body would be justified and meaningful. Positive results would confirm that the human brain can directly and nonlocally access some elements of the information in the world beyond the brain and body. This would reinforce the increasingly widespread belief that human beings (and by extension all things) are connected with each other and with nature in more subtle ways than through the stimulation of sensory organs.

Note

1 A more detailed exposition is given in the author’s latest book, \textit{The Akashic Experience} (Laszlo, 2009), together with suggestions for further research.

Acknowledgments

The author wishes to thank Allan Combs, Larry Dossey, Ede Frecska, and Stanley Krippner for their valuable comments and important research materials.

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LETTERS TO THE EDITOR

Analyzing Mediumistic Mentation

Rock et al. (2008) are to be congratulated for focusing our attention in the Summer issue of the JSE on the variety of experiences of mediums. Their work as well as the studies of Barrett (1996) and Emmons and Emmons (2003) represents modern research with the mentations of mental mediums that focuses on aspects other than veridical content. They presented descriptions of the type of sensory imagery experienced by mediums, as well as their feelings and impressions. This work is essential for our understanding of mediumship and I hope that they can continue it. The authors mentioned some ideas for further research and, along these lines, I would like to recommend that future studies could build on observations and analyses reported in the previous literature on the subject, particularly the old psychical research literature, although I realize that recent writings also have relevant information. In what follows I am covering some aspects that may not be the primary concern of Rock et al.

There is much about the variety of sensory modalities and impressions in the autobiographies of mediums, as seen in the writings of Eileen J. Garrett (e.g., Garrett, 1949). Emmons and Emmons (2003) reported an analysis of 122 statements with mediums, 40 of which came from interviews with mediums, and 82 from published accounts. Of 98 cases with information about the modalities of expression, 72% reported having some visual experiences. There were also auditory experiences (66%), and a general group consisting of a variety of intuitive, emotional, and bodily sensations, as well as other experiences (42%). Balfour’s (1935) examination of Mrs. Willett’s mediumship showed that she had impressions of presences, emotions, and impulses and inhibitions, among other manifestations.

There are many descriptions on record of the varieties of visions some mediums have had. Some of them, such as those D. D. Home had, are evidential, consisting of visions of spirits standing in the séance room with enough details to be recognized by sitters (Coleman, 1868: 37–38). There are, or course, other visual experiences that convey information. But I also find interesting those experiences that consist of non-evidential visions. Examples from the old literature include those seemingly symbolical visions reported by John W. Edmonds in which he saw places and people in a variety of environments (Edmonds & Dexter, 1853), and Andrew Jackson Davis’ (1868) descriptions of landscapes and life in the afterworld. Can we assess how often these visions take place in modern mediums? Would it be possible to create a classification of the contents of such visions as a prelude to more systematic research?
In his study of Mrs. Warren Elliott, Saltmarsh (1929) referred to symbols he believed appeared in the medium’s statements: “It will be observed that the symbols are . . . what might be called natural symbols, and are based on habitual analogies, either verbal, as for example when the hallucinatory figure coming near to the sitter is taken to mean nearness of relationship, or common forms of speech, as when all black is used as a symbol for worry or sorrow; or else they may be natural pantomime . . . ” (Saltmarsh, 1929: 123). A systematic study of symbols used by each medium, and a comparison between mediums, would produce fascinating data. Such analyses need to consider how mediums developed, if they received particular training, or were influenced by particular cultures or concepts.

Other observations that may guide modern research are the records of the mentation produced by Gladys Osborne Leonard (e.g., Radclyffe-Hall & Troubridge, 1919; Thomas, 1928). In some séances she perceived letters instead of names, and the messages came in fragments. This fragmentation of mediumistic messages was noticed by others. Writing about Leonora E. Piper, Oliver Lodge (1890) stated: “In the midst of . . . lucidity a number of mistaken and confused statements are frequently made, having little or no apparent meaning or application” (Lodge, 1890: 443).

I would also like to mention James H. Hyslop’s (e.g., 1919) writings about what he referred to as the pictographic process, in which “the communicator manages to elicit in the living subject a sensory phantasm of his thoughts, representing, but not necessarily directly corresponding to, the reality” (Hyslop, 1919: 111). This process, Hyslop believed, could account for all kind of distortions in the communications due to many factors, among them the difficulty in controlling the flow of irrelevant imagery, and the interpretation of images by spirit controls, the medium’s subconscious mind, or both. Analyses of mediumistic mentation following Hyslop’s model may be productive, both in terms of replicating his observations and supporting or extending his ideas.

Most modern studies are conducted with groups of people. While there is more to do following this approach, I would like to encourage in-depth case studies of specific mediums. Some examples of past detailed studies of single mediums include investigations of Hélène Smith (pseudonym of Catherine Elise Müller; Flournoy, 1900), Leonora Piper (Sidgwick, 1915), Pearl Curran (Prince, 1927), and Eileen Garrett (Progoff, 1964).

We also need a more general research program that focuses on the psychological profile of mediums (e.g., Moreira-Almeida et al., 2007). I was glad to see in Rock et al.’s report that they administered psychological questionnaires such as the NEO Personality Inventory and Tellegen’s Absorption Scale, and I am looking forward to their analyses of this data. I wonder if future studies may be able to relate specific patterns or features of mediumistic mentation to psychological variables. An idea, among many, would be to follow Irwin’s (1979) study of visual and verbal coding preferences in relation to the modality of spontaneous self-reported ESP experiences. Perhaps we may find that mediumistic mentation
follows the medium’s cognitive preference. Interestingly, Hyslop (1919) wrote about one of the mediums he studied: “Mrs. Chenoweth is par excellence a visuel only and nothing of an audile. Mrs. Chenoweth showed no aptitude for auditory phantasms; it took two or three years of training to elicit any of them to help out the meaning of the visual images, which she received with comparative ease” (Hyslop, 1919: 118).

The above suggestions may be studied in relation to veridical aspects of mentation. But, as important as such veridical aspects are, there is much to do with mentation itself. Just as there are studies in psychology of the content of dreams and imagery separate from ESP, we could study mentation as a psychological phenomenon. This would produce much knowledge about mediumship. Fortunately, and as seen in Rock et al.’s paper, there are contemporary mediums who are willing to assist investigators interested in these matters.

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Proposal for Short List of Best Papers in Parapsychology

I propose a project to assemble a definitive list of “the best published experiments in parapsychology”. Of course it could be revised later as new work comes out, but for now, I suggest that we use the combined wisdom and experience of the SSE community to put together a definitive list of the best papers in the parapsychology field, to be used as a ready resource for when skeptics and colleagues ask to be pointed to “the best evidence”. The papers to be included in this field should ideally be

- extremely well controlled (showing a convincing anomalous effect that is unlikely to be due to errors of experimental protocol or statistical analysis)
- informative (uncovering something interesting and important about the process in question—real, concrete conclusions)
- performed by individuals with rigorous backgrounds in the relevant field and good reputations (preferably also in fields outside of parapsychology)
- published in solid, peer-reviewed journals
- demonstrate to the mainstream community how controlled, scientific approaches can make progress in this field

Such papers are unfortunately scattered widely among the biomedical, psychological, engineering, and social sciences literature, making it difficult for interested people to find the right publications. They are also not indexed in the major databases (such as PubMed). There is a great need to have a ready reference list for colleagues, and to cite in our own papers, of not simply every paper, but a short list of the most impressive studies. Having chosen a list of categories (telepathy, remote viewing, microPK, etc.), SSE members are invited to send me the references (and full-text PDFs, if available) for one or a few such papers in whatever category they know best.

This should include classical studies (e.g., card guessing), but crucially also the latest work combining MRI brain imaging of precognitive tasks, meta-analyses of quantum RNG experiments, etc. Ultimately, it would be most useful to maintain an archive of references (and full-text papers, where possible) to refer to when challenged by open-minded skeptics who want to review the best evidence. It is
unlikely that this list will convince die-hard skeptics. However, we cannot reason-
ably expect active scientists from other fields to sift through poorly indexed
literature and weed out the truly superb papers from the many problematic studies
that have been published. As a community, we can maximize the in-flow of
intellectual resources, and perhaps attract young scientists towards these non-
mainstream topics, if we are able to point interested individuals towards the best
work that our field has to offer. I encourage all readers to pick the papers in this
field that they feel best represent the evidence and would be convincing to a rigor-
ous but open-minded colleague, and send them to me at mlevin@drmichaellevin.
org. I will collect the list and ultimately submit it to the *JSE* for access by all.
Subsequent discussion of the list among the community (the pros and cons of
specific papers appearing on this list) should also prove enlightening.

MICHAEL LEVIN
Forsythe Institute

**Editor:** In D. P. Sheehan’s (2008) article in *JSE*, several claims and proposals
were based on background information of disputed veracity. The claim that the
burning of fossil fuels is implicated in global warming is falsified because world
hydrocarbon use is not correlated with arctic air temperature, which is better
correlated with solar activity. Glacier shortening was on a linear path from 1830
to 1975, and not affected by the burning of fossil fuels (Robinson et al., 2007).
“Degradation of the biosphere” varies with location, but the currently increased
carbon dioxide level allows more food to be grown. Indeed, greenhouse operators
often use 2–3 times the current carbon dioxide concentration of 385 ppm in green-
houses to increase crop yields. The only link, if any, of food shortages with energy
supply was making fuel ethanol from corn.

The comfortable temperatures over much of the Earth are due to heat holding
by water vapor (mainly) and carbon dioxide (plant food); we could not survive
without them. More water vapor has led to more humidity and rain, but more
clouds cool the Earth, so there is a balance. There is no correlation between
carbon dioxide levels and higher Earth temperatures. Those levels were deter-
mined by direct chemical measurement beginning in 1812. Over 185 peer-
reviewed papers confirm this, finding those levels peaking at 450 ppm in 1822,
370 ppm in 1858, and 420 ppm in 1942 compared with 385 ppm today. A period
from 1870 to 1925 at 310 ppm belied any effect on carbon dioxide levels from
burgeoning industrialization based on coal burning and cement production.
No correlation whatsoever with temperature peaks exists. The temperature drop
from 1940 to 1978 was accompanied by a carbon dioxide rise from 1957 to 1978
(Kauffman, 2007), and the temperature drop from 1998 to 2008 was accompanied
by increasing carbon dioxide (NOAA, 2008).
Later Sheehan wrote that pollution from nuclear fission could be eliminated. I thought the moratorium on nuclear bomb testing accomplished that. Nuclear power generation was not specified, but it has always been promoted as being non-polluting. He suggests that “greenhouse gases” be scrubbed from the atmosphere with a proposed solid-state device. Since the main “greenhouse gas” is water vapor, this would seem a huge undertaking with no benefit, since rainfall would be decreased. Removal of carbon dioxide would decrease food supplies with no benefit.

The term “climate change” was used at least twice with no explanation, as if to indicate that any change would be bad, yet there are and have been cycles of warming and cooling of 22, 60, and 1500 years’ duration mainly due to changes in solar output, the Earth’s distance from the sun, and the changes in cosmic ray flux thought to vary inversely with the number of sunspots (Kauffman, 2007).

Of course, very cheap energy from an inexhaustible source would be pleasant, thus some research effort is warranted. But the factor of unrestrained human population growth was ignored.

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**References**


**Editor:** In the Winter 2008 issue of the *JSE*, Radin, Lund, Emoto, and Kizu report an investigation of the effects of mental intention on the formation of ice crystals. However, as the treatment samples were all drawn from the same two bottles that had been the target of mental influence attempts and the control samples were all drawn from the same two control bottles, the trials are not statistically independent. For this reason, the bottle rather than the sample should be treated as the unit of investigation. Thus, the highest one-tailed significance level attainable in this experiment is 0.167 (the probability that the two treatment bottles would be ranked higher than the two control bottles by chance).

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BOOK REVIEWS


Michael Brooks has presented us with 13 discussions of natural phenomena, all of which we must classify as anomalous because they challenge current scientific paradigms and our conceptions of reality. But the chosen 13 are not all equal in their anomalousness, nor in their reception by the Scientific Community.

I visualize the world of anomalies as three-tiered—like the Earth’s core, mantle, and crust. At the center are the solid anomalies that all scientists admit exist, like the deep mystery of action-at-a-distance forces. Wrapped around this core is the thick mantle where reside those anomalies still lacking in adequate hard supporting data, that are contentious, and yet still are attractive research targets in the Scientific Community, such as the study of calendar savants. On the crust of this world of anomalies are a host of “fringe” topics, such as UFOs. These are generally eschewed by scientists for fear their inquiry would damage their reputations and scare away research grants.

The author of this book holds a Ph.D. in quantum physics. It is, therefore, not surprising that many of his chapters are located in the iron core of the anomaly world; that is, they are fit for discussion at those high tables at British universities. For example, we find excellent discussions of dark matter, the Pioneer anomaly in which some deep-space probes apparently defy Newton’s Law of Gravitation, the origin of life, the Wow! radio signal of August 15, 1977 consisting of a 1420-Hz spike potentially of alien origin, and the giant newly-found “mimivirus.”

In the mantle of Planet Anomaly, Brooks finds and treats with fairness some less-solid subjects, such as the utility of sex in the evolution of life, the claims that the constants of nature vary, and the curious placebo effect.

Even more daring, he tackles a few “fringe” (crustal) subjects such as homeopathy, cold fusion, and the ambiguous “life” data from the 1976 Viking lander on Mars.

Even though Brooks is a science writer, and thus more free to expand his anomaly net, we see no treatment of, say, Nessie, toads in solid rock, or crop circles. No Forteania in this book. They are somewhere out in the forbidding stratosphere.

The book’s notes and references are virtually all from distinguished science journals and “acceptable” literature. Brook’s advisors, reviewers, and consultants are almost exclusively from the Scientific Community.

Therefore, a “solid” book for sure and fascinating as well.

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This book is for scientists who gather evidence of the shortcomings of present-day physics. They signal a major paradigm change in the twenty-first century. Dr. Thomas E. Phipps, Jr., is the dean of relativity critics. Einstein’s writings are not the only subject attracting his attention. His penetrating analysis includes the empirical discovery of instantaneous action at a distance in quantum mechanics. An outstanding feature of Heretical Verities is the constructive mix of theory and experiment.

Phipps’ book consists of three parts: (I) Kinematics and Electromagnetism, (II) Mechanics, and (III) Mathematics and Statistics. The last part records a range of original contributions to the mathematics of quantitative science. It stands aloof of possible paradigm changes and is written in the same entertaining style which is used throughout the book. This does much to enliven otherwise dry subject matter. Here is a sample: “It ties probability, statistics, and information theory together in a neat package of brotherly Musketeerhood…. I am not a mathematician and my review is limited to the first two parts of the book.

An early problem challenging special relativity was Ehrenfest’s paradox which referred to a rotating metal disk in which the Lorentz contraction requires a shortening of the circumference without a change in the perpendicular radius of the disk. Phipps describes the lively discussion which this paradox launched and concludes: “Tis not love but elasticity that makes the world go round.” The preface of the book is dated 1986 which was just before Phipps conducted his own experiments refuting relativity theory.

An interesting point, which is rarely mentioned in the physics literature, is that the recoil momentum of the Moessbauer effect is taken up by the metal lattice as a whole and therefore is a non-local happening. “Such non-localized events,” says the author, “seem to cry out for a concept of distant simultaneity.”

Einstein’s view of light receives special attention. His postulate that the velocity of light through space is not at all influenced by relative motion of the light source and the absorber gave rise to a special brand of relativity. Phipps believes this will probably have to be abandoned at some future time. He compares the photon’s wandering through space with “Dick Whittington” who does not have the slightest idea of what awaits him on the way or whether he will ever find a home.

The quantum interaction of a photon source and an absorber is no Dick Whittington event. It describes events which can be observed and measured. Nothing seems to be traveling at the velocity of light between source and sink. The velocity of light becomes a universal constant dealing with energy exchanges between remote particles of matter. The beginnings of such a theory have been proposed by Neal Graneau in a paper titled “Have you Seen the Light?” (A. E. Chubykalo, V. Pope, R. Smirnov-Rueda, Editors, Instantaneous Action at a Distance in Modern Physics: Pro and Contra, Nova Science Publishers,
Commack, New York, 1999). Unfortunately, the latter book was published 13 years after *Heretical Verities*.

The providential steering of the energy flow through space is in conflict with absorber theories as, for example, that of Wheeler and Feynman. The reader is directed to Fokker who claimed that a sun alone in the universe, without absorbers, could not radiate. Phipps believes that Wheeler and Feynman abandoned their half-advanced and half-retarded instantaneous potentials prematurely because they were insufficiently radical to follow through with their revolutionary action at a distance idea.

The young graduate student Richard Feynman persuaded his supervisor at Princeton University, Professor John Wheeler, that a photon traveling in space may not be guided by the local electromagnetic field, but rather is steered by interactions with distant matter particles which will ultimately absorb the photon. This theory, which was published in *Reviews of Modern Physics*, trades the field concept for Newtonian mutual simultaneous interactions. Phipps believes that the Wheeler-Feynman absorber theory proved to be a dead end, not because of the scientific method, but rather because neither of the two authors persisted in their efforts. Wheeler is said to have subsequently repudiated the whole approach.

*Heretical Verities* goes into great detail to describe and analyze Hertz’ work. Hertzian electromagnetism has the potential of replacing Maxwell’s field theory and with it Einstein’s special theory of relativity. Hertz does not drop Maxwell’s equations, but modifies them by replacing all partial time derivatives with total time derivatives. This makes the Hertzian field equations invariant under Galilean co-ordinate transformations. By contrast, the special relativity equations are not invariant with respect to Galilean transformations, but become covariant under the Lorentz transformations. The physical difference between invariant and covariant mathematics is treated in great detail by Dr. Phipps. His crucial objections to the Maxwell-Lorentz-Einstein theory largely disappear when Hertz’s equations are adopted.

Einstein rejected the whole of Newtonian physics (action at a distance) as being “spooky”. By this he meant that mutual simultaneous attraction and repulsion of matter particles is not a law of nature but something invented by magicians. In the extensive writings of physics I have found nobody like Phipps, who questioned Einstein for associating experimental physical evidence with an abstract word of the English language, that is by “spookiness”. Under the heading of “Bell’s Theory and All That” Phipps questions the adjective “spooky”. He writes:

My approach to these matters is the following: Spookiness (1), which is the one Bell concentrated on, I have to accept, because it involves observationally verified aspects of accepted quantum mechanics. The wave functions of my theory differ from those of accepted theory only by constant (unobservable) phase factors. Hence my covering theory of accepted quantum mechanics inherits from the covered theory any spookiness that originates in equations of motion. As I said at the outset, it seems to me that the human mind adjusts its ideas of “reality” to accommodate what is observed in the “real world”, as
a precondition to getting on with the task of extending its comprehensions into the area of subnuclear descriptions. The elimination of Einstein’s idea that all distant actions must occur retardedly at speed c, and that there is no meaning to distant simultaneity—as accomplished earlier in this book—seems to me to ease the swallowing of the philosophic pill associated with nonlocal “instantaneous” distant-action effects of the EPR sort. (p. 391)

The book examines the physics of gravity. In modern science it is argued that the gravitational attraction of two objects should be a consequence of their exchange of virtual particles called gravitons. To comply with the special theory of relativity, the gravitons should not travel faster than light. Against this, as Thomas Phipps recalls, LaPlace showed long ago that, if there were any retardation of the distant action of gravity forces, it should become evident in astronomical measurements relating to the solar system, so long as the speed of gravity at least exceeded \(10^8\) times the velocity of light. Recently this figure has been elevated to \(10^9c\) by Tom Van Flandern, formerly of the U.S. Naval Observatory.

The finite speed of gravity should affect space travel. Phipps reports that NASA does all its space flight computations on the assumption of gravitational interactions with the planets and the sun being simultaneous amongst participating bodies. No experimental proof to the contrary has been forthcoming. Therefore, astronomy vindicates Newton’s law of gravitation.

Phipps’ valediction to science is his courageous defense of the idea that the electron is the ultimate constituent of matter. He argues that this follows from the scientific discipline of mechanics initiated by Newton, who hoped it would guide us to understand the remaining phenomena of nature. According to the author, Newtonian mechanics is a covering theory of quantum mechanics and the electron is the building block of the universe.

The positron is the same particle as the electron, but with its electrical charge reversed from negative to positive. All ponderable matter—and the vacuum—are composed exclusively of beta-particles or electron-positrons. This is the Phipps beta-structure hypothesis. The vacuum is involved in this structure because of Dirac’s sea of negative energy electrons. Dirac’s sea of negative energy is not related to the ethers of Maxwell or Hertz. Chapter 10, entitled “Nuclear Mechanics”, is devoted to the beta-structure hypothesis. It could be wrong, as the author freely admits.

The strongest support for the validity of the beta-structure hypothesis derives from the fact that nature produced only microscopic particles with an integral multiple of the electronic charge. Quarks with their fractional electronic charge do not travel through space or exist independently. They do not have to comply with the beta-structure hypothesis. Anyhow, unlike real particles, quarks come in flavors, except chocolate-mousse, as the author remarks.

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Dr. Hamilton, former Chief of Neurosurgery and Chairman of the Department of Surgery at the University of Arizona Health Sciences Center has provided a book that is essential reading, as anyone may be confronted by major medical decisions. He skillfully takes us on his life’s journey, beginning with significant events in his early years that motivated him to be a neurosurgeon along with insights gained from unusual experiences of surgical patients throughout his career. These patient experiences included accurate premonitions through intuitions and dreams before surgery and out-of-body experiences (OBEs) and near-death experiences (NDEs) during surgery. Such incidents led Dr. Hamilton to accept the possibility of the paranormal and that the mind can experience phenomena unexplained by modern science and often ignored by the medical profession.

He openly discusses metaphysical beliefs, describing some that link to his early medical work in a small hospital in the jungle town of Lambaréné located on the equator in Africa where Dr. Albert Schweitzer had been a missionary physician. The power of dreams was made known to him while traveling by dugout canoe to a remote river village. A native had been alerted via a dream of his approaching arrival many days before his actual arrival. Incidents of a metaphysical nature led Dr. Hamilton to accept the mystical aspects of aboriginal belief systems and its importance in their lives. In his view, “superstitions, omens, and intuitions are the reflections of a conscious effort on the part of the individual to detect the subtle signals sent to us from the natural world” (p. 28). He sees these mystical unknowns as natural, even though they may be interpreted otherwise. Dr. Hamilton relates his debilitating back injury when serving in the U.S. Army during Desert Storm. Later, he experienced the healing power of a Navajo shaman who helped him recover from this injury. Throughout the book, Dr. Hamilton moves between the objective needs of the surgery and the subjective needs of the person, indicating their underlying connection, their unity.

Vignettes of specific incidents provide examples of patients’ backgrounds and social dynamics leading to surgery. One heart wrenching incident occurred in a children’s burn ward when a young burn victim saw an apparition of his deceased father although he was unaware of the death. He includes his interview with a woman intentionally made clinically dead for 15–20 minutes by cooling her core temperature to achieve a state of suspended animation. It was necessary to cut off blood flow to her brain so that difficult surgery for a brain stem area aneurysm could be performed. After recovery she described perceiving unique details about the operating room and the medical staff who came to assist with the surgery. Dr. Hamilton cites this case as potentially supporting the existence of something beyond the brain—a soul—that can survive bodily death.
These details are a necessary part of events as we come to know the person who is faced with a life-changing situation. The emphasis on people clearly comes through in his writing style. We experience, along with him, the compassion, even spiritual connections, that he felt as he entered into each life-death drama as the door to the operating room closed. As readers, we wonder whether the complex brain surgery will succeed or not. Dr. Hamilton keeps focus on success, not failure or even the possibility of failure. This book has great insights, advice and a mix of lessons learned from his decades as a neurosurgeon that apply to any endeavor. He critiques current physician training methods and urges an approach that seeks to develop compassion along with technical skills.

The section, “Twenty Rules to Live By” has many practical recommendations to prepare for, and follow after, surgical procedures to avoid frequently occurring misunderstandings and to prevent errors or unnecessary surgery. Dr. Hamilton emphasizes the importance of a patient advocate to help with questions, keeping records of all pre- and postoperative requirements and activities.

There is much more to this fascinating book and closing with a portion of the subtitle is appropriate: The Power of Hope. Dr. Hamilton’s main insight in this book is that we should never underestimate the role of attitude, determination and will during adverse circumstances in our lives.

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Around 400 accounts of unusual encounters with a brilliant and outstanding light or lightform are the unusual focus of the current book Lightforms by Mark Fox, Lecturer in Philosophy and Religious Studies at the Joseph Chamberlain College in Birmingham, UK. Fox presents new and fascinating case material, which he had discovered in Alister Hardy’s archive containing upwards of 6000 reports from 1969 onwards at the “Religious Experience Research Centre” (RERC) located at the University of Wales in Lampeter. From the approximately 700 cases that came up as a result of his data search with the keyword “light”, he selected for his analysis this core of 400 accounts concerning light experiences in various and shapes and forms, but excluded those cases which might be classified as apparitional or dream imagery.
Although such experiences seem to be more common than one would expect and often have a life-changing effect, researchers have not as yet given much attention to this fascinating topic. (A noteworthy exception is *Transformed by the Light* by Peter and Elizabeth Fenwick, 1995.) The scientific literature, beginning with Raymond Moody’s book *Life after Life* (1975), has as yet only approached the theme from a broad perspective, mainly of near-death experiences (NDEs).

However, Fox’s study does not concern only NDEs—although the collection of NDEs he presents is important because it dates back to before the year of Moody’s publicized descriptions, indicating that such cases could function as a control group. They also include angelic experiences. This is a fascinating area in its own right and has recently formed the basis of *Seeing Angels* (2001), a pioneering doctoral thesis by Emma Heathcote-James at the University of Birmingham.

As well as the more spectacular cases, Fox’s study contains those that are more mundane and that occurred on an ordinary day in everyday life. Of particular interest for consciousness studies is the fact that the case collection is not exclusively presenting experiences made with an “inner eye”. Some persons also report being fully awake while witnessing the lightform—whatever we might conclude this to be. Accordingly, Fox had to follow up the question concerning the location of the source of the sightings with more specific ones: Was the lightform inside the seer’s brain or did it appear outside right in front of the eyes and could be perceived in an usual way? Nevertheless, Fox wonders whether something can be concluded from this distinction, “Or may it be the case that a common, transcendent otherworldly source is responsible for a large number of unusual encounters with light and therefore responsible for their consistency and sharing of common features?” (p. 4).

Part One of the book starts with a description of Sir Alister Hardy’s life (1896–1985) as a “spiritual odyssey” (pp. 11–33) and his search for “evidence of people’s experiences of being in touch with some form of transcendental element beyond the self”. Hardy was himself in touch with “something bigger than myself” and describes his own religious experiences as “Wordsworthian in feel” as for instance occurred when he saw the sunlight through young lime trees (p. 14). Later on he had arrived at “the curious feeling that all the events in my life have been arranged as if by some benign power” (p. 20). It was perhaps this which, after completing an academic career in natural history and zoology at Oxford, led Hardy to find the pure scientific world-view too narrow and to seek the reconciliation of science and spirit (p. 12). It became important to him to consider both religious and paranormal experiences side by side (p. 19). Hardy’s book, *The Spiritual Nature of Men* (1979), an analysis of the first 3000 cases of his collection, can be regarded as a concrete realisation of this aspiration.

Fox then gives an overview of the variety of unusual light experiences found in shamanic, yogic, mystic, Buddhistic, and Jewish traditions, as well as Christian tradition with its visions of angels. He finds there is “a clear relationship between experiences of light and transformation” not only across those traditions but also in Western reports of NDEs and their common encounters with angels (p. 52).
Fox identifies what he calls “a ‘common core’ at the very heart of humankind’s spiritual and religious experiencing” (p. 53).

In Part Two, the main part, we get closer to the basic case material amounting to 144 cases which were selected from the total of 356 reports. Fox pays attention to the problem of verification by further selecting cases which occurred in the presence of multiple witnesses. Religious apparitions occur often to single persons such as the many appearances of the Virgin Mary but there are many collective religious visions as for example the Marian apparitions in Medjugorge, and the “dance of the sun” at Fatima in 1917 which had about 150 witnesses (pp. 58–59). Shared light experiences are also known from folklore, such as the death foretelling corpse candles in Wales.

Fox gives us 10 case examples of shared religious experiences from Hardy’s archive, of which half concern “crisis lights” (pp. 69–76). This fits well with the fact that over 50% of the cases concerning light in the entire archive take place in times of trauma and crisis.

In order to link these findings to science, Fox relates the experiences with light to current brain research, in particular the experiments reported by Newberg, D’Aquili and Rause and summarized in *Why God Won’t Go Away* (2001). Their results showed that the input to the posterior superior parietal lobe is blocked during meditation, which means the part of the brain responsible for maintaining the boundaries between the self and the rest of the world is temporarily in abeyance and, therefore, allows the meditating person to have the profound experience of unifying with the whole. Fox further discusses Persinger’s laboratory research, which claimed that stimulating certain parts of the temporal lobe could elicit “religious, paranormal, and other ‘varieties’ of transcendent experience” (p. 58). It should be noted that Swedish researchers recently were unable to replicate Persinger’s work and concluded the findings were probably a form of expectancy effect.

Fox distinguishes different types of light experiences, specifically “outdoor” lights, “multiple” lights, “lightbeams”, lights that move, lights that fill the person from inside or envelop the person, unusual “brightenings” and illuminations of people. He also investigates the various possibilities of perceiving the light with the ordinary senses, including those experiences, which seem to derive from something like an “inner” perception.

What Fox emphasizes most of all in his review is the impact that these unusual lights can have on the persons and their lives. Light brings comfort at the appropriate time in life, during periods of stress and crisis, and at death. The religious meaning of the experiences is in their form of impact, which can come as an “angel of goodness”, which was how one percipient described it (p. 83).

Part Three does justice to Hardy’s effort to achieve a reunion between the worlds of science and spirit and begins with the results of quantitative analysis: The three most common case groups are solitary experiences of unusual light, visionary encounters with light, and unusual lights that “wrap and fill”. It is noteworthy that about 51% of all cases include a crisis component but “even more
striking is the overwhelmingly positive nature of the light experiences” (p. 171). It is clear that most if not all the respondents highly value their experiences. Fox notes how the light can wipe away tears (pp. 151–153), fill with delight (pp. 153–154), and surround people with love (pp. 104–106).

Despite the religiosity of such experiences, a detailed discussion is made of the recent attempts to explain unusual light phenomena in a more reductionistic way—ranging from “battle neurosis” (Sargant), mental dysfunction (Newberg), and migraine (Sacks) to the current notion of temporal lobe excitation (Persinger). In dealing with attempts to pathologize the experiences, Fox refers to the important work of Saver and Rabin, which analysed the differences between psychotic hallucinations and genuine experiences in the context of “culturally accepted religious-mystical beliefs” and concluded from this “that mysticism is not a product of psychotic delusion” (p. 180).

Since there is not as yet a satisfactory explanation for these experiences and that these experiences seemingly are not after all so unusual, I find myself in agreement with Fox—that “a mystery remains” (pp. 196–197). Fox’s case collection is a fascinating testimony that some sources of light are not merely of solar origin but may represent a transcendental source.

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(Annekatrin Puhle is currently engaged in research on lightform phenomena. Experiencers are invited to contact her.)


Dr. Jesse Xiong is a professor of philosophy from NanKai University in China and was a visiting scholar at the University of Toronto. His book was originally written as an introduction to parapsychology for Chinese readers; it summarizes a massive amount of information clearly, critically, and concisely, and is an able introduction for anybody curious about the subject. Each of the seven chapters is broken up into sections ranging from five to fifteen. The Introduction calls attention to the controversial and apparently challenging nature of the field to mainstream science and religion. The first two chapters cover a history and the research methodologies of parapsychology, stressing the importance of gifted subjects. Xiong provides detailed critiques of the skeptics and their claims.

Chapters Three and Four deal with extrasensory perception and psychokinesis. The approach is historical and comprehensive and distinguishes between various
exotic subtypes of phenomena such as skin vision, psi phenomena of taste and smell, including a discussion of borderline cases of “quasi-psi.” The latter raises the question of how much psi may be inconspicuously or fleetingly present in our mental life, and reminds one of the nuanced taxonomies characteristic of Frederic Myers’ work. Xiong is not afraid to include in his review reports of apports and deports, materialization, odor of sanctity, bodily elongation, incombustibility, incorruptibility, paranormal healing, and the paranormal curse. He provides a sketch of several notable physical mediums.

The fifth chapter deals with discarnate entities. Once again, the author tries to give a big picture of all the different types of suggestive evidence for the notion of excarnate consciousness. He describes phenomena of possession and obsession, materialization of deceased personalities, direct voice and writing phenomena, so-called channeled entities, plus the more commonly treated types of survival evidence such as mediumship, hauntings, apparitions, veridical out-of-body states, and reincarnation memories.

The last two chapters cover altered states of consciousness and theories and possible explanations of phenomena. In addition to dreams, psychedelic states, meditation and hypnosis, some pages are given over to “psychopathy” as a possible causal factor in the manifestation of psi.

The discussion of theory covers quite a bit of territory but is sketchy and sometimes confusing. Myers’ theory of the subliminal self is discussed under the heading of physiological explanations of psi. The notion of “cosmic consciousness” is wrongly ascribed to James (rather than Bucke) and too hastily identified with the Hindu concept of Brahman. The author touches on many concepts such as synchronicity, quantum physics, wormholes, observational theories, holograms, ontology, dualism, and much more. The implications of parapsychology for religion are discussed, and Xiong sees parapsychology as being at odds with “ecclesiasticism,” by which he means organized religion hidebound by dogma and hierarchy. In an interesting way, he begins to sketch his hypothesis that “pantheism” (with resemblances to Whitehead) offers the best route to a theoretical foundation of parapsychology. An appendix listing resources for further study of the field is a useful addition.

Unfortunately, the text is marred by numerous grammatical and stylistic infelicities; one prominent example being the awkward misuses and omissions of definite and indefinite articles. It does not detract from the value of the book’s content, but it is a distraction. Any future edition of this book, which overall I recommend as useful and stimulating, should be carefully edited for these mistakes.

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The first and last time I jumped out of an airplane, I was 17 years old. It was my mom who nearly died of fright. She had to sign a waiver that listed in gruesome detail all the ways her underage, unlucky son could die or sustain serious injury from skydiving. True to the odds, nothing went wrong. After 4 hours of “training,” the actual skydive, from Geronimo! to hard landing, lasted just a few minutes. My weekend parachute was an adrenaline rush, but hardly death-defying or life changing.

Maria Coffey’s extreme adventurers, in contrast, push themselves physically and psychologically to the breaking point. Skydiver Cheryl Sterns jumped from an airplane 352 times in 24 hours, setting a Guinness World Record. Tanya Streeter free dove without oxygen to a depth of 525 feet below the ocean’s surface holding her breath for almost 3½ minutes, her heart rate plummeting to five beats a minute, before resurfacing. Cyclist Jure Robic pedaled for 3042 miles across the continental U.S. in 8 days, 19 hours and 33 minutes.

Such super-athletes suffer mind-numbing exhaustion, unbearable pain, intense solitude, sudden terror, and narrow escapes from death—conditions which parapsychologists know can generate paranormal experiences. And the heroes of this book have a journal’s worth, experiencing time distortions, altered states of consciousness, telepathic communications, out-of-body experiences, precognition, premonitions of death, and visions of the dead.

The reading pleasure for me came less from the garden-variety paranormal experiences these crazies report than from the god-awful, insane exploits which trigger them.

Fifty-five-year-old ultra-marathoner Marshall Ulrich had a classic out-of-body experience running the Badwater, a 135-mile, non-stop foot race across Death Valley in July when daytime temperatures can hit 129 degrees Fahrenheit. He’s done it 13 times and won it four times. Insanely, he once did it four times back and forth, non-stop, for over 77 hours, while pulling a modified baby jogger loaded with 200 pounds of water, ice and spare clothes. In 1993, while trying to break his own record, he suddenly stepped out of his body. From above, he watched himself running along, “like watching myself on a movie screen.” He remained out of body all night, until the next morning when he realized that “dawn was coming, the sun was about to rise. I knew it was time to go back into my body.” (Skydiver Sterns experienced a similar, extended OBE during her non-stop jumping.)

“Many mountaineers have sensed unexplainable presences in the high mountains,” notes Coffey. American climber Lou Whittaker in 1989 was guiding the first American assault on 28,169-foot-high Kanchenjunga in the Himalayas, the third tallest mountain in the world. At his base camp, he kept sensing the presence
of a middle-aged, friendly Tibetan woman spirit who communicated with him mentally, telling him everything would go OK. His wife Ingrid arrived at the base camp shortly after Lou had departed for the summit, but her ascent to 16,000 feet was so fast she suffered severe altitude sickness. She spent 3 days in agony in Lou’s tent, ministered to by the same Tibetan spirit. “She was wearing a headscarf and a long dress. She was shadowy and two-dimensional, like a silhouette.” The spirit would put her hand on Ingrid’s forehead, very comforting, and help her to roll over. She didn’t speak; the two women communicated telepathically. Two months later, after they had returned to the States, Ingrid finally told Lou about her strange helper. Stunned, he admitted seeing her too. They’re convinced it wasn’t a hallucination, since both sensed the same apparition. Coffee notes similar “spirit friends” assisted and comforted many well-known adventurers in their perils, including Antarctic explorer Ernest Shackleton during his desperate 36-hour trek across frigid South Georgia Island; aviator Charles “Lucky” Lindbergh on his record-breaking, non-stop transatlantic flight to Europe in 1927; and mariner Joshua Slocum, the first man to sail solo around the globe.

In 1997, Tony Bullimore was attempting to duplicate Slocum’s feat, competing in the around-the-world Vendee Globe single-handed yacht race. Two months into the race, a fierce storm in the Southern Ocean rolled his boat, trapping him upside down in his watertight cabin for almost 5 days. Race officials informed his wife Lalel his upturned boat had been spotted in huge seas; he was presumed dead. That night, kneeling by her bed, she received a telepathic message from him. He was alive, he had food and water, but he was exhausted and had to sleep. The following day, he mentally spoke to her again. “Oh Lal, I’m in a mess. It’s wet. The boat won’t stop rolling. I’m cold.” She told him to keep fighting. Back in his watery tomb, shivering and staring into darkness, he suddenly had a vision. He saw an Australian warship steaming for him, a boat was lowered, sailors started banging on the hull, and he watched himself swim to the surface where he was rescued. Twenty-four hours later, everything happened exactly as his vision had foretold.

Coffey presents dozens of such puzzling experiences while pondering their reality and meaning. For an outdoor adventure writer, she demonstrates a surprising familiarity with parapsychological literature, referencing among others Rupert Sheldrake’s ESP research; Montague Ullman’s dream lab investigations; NDE studies by Raymond Moody and Sam Parnia; plus conventional counter-explanations from popular skeptics like Susan Blackmore and Robert Persinger. Her references are understandably brief and occasionally incorrect—for example, her assertion that scientists know very little about the out-of-body phenomenon (p. 250). Psychologists, physicians and investigators such as Charles Tart, Stuart Twemlow and D. Scott Rogo mapped the phenomenon several decades ago, and recent NDE research has advanced our understanding. We know a lot about them; it’s just that, like so many other paranormal phenomena, we can’t agree on where they fit in our current model of reality.
But Coffey can be forgiven for not penning a dry parapsychology book few would read. She offers enough science to ground her stories, but wisely focuses on the sense of surprise and wonder her eclectic community of daredevils find in their unexpected brushes with the infinite. As British BASE jumper Shaun Ellison puts it, “There’s so much out there that we don’t understand.”

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Eighty years ago, Sir Arthur Eddington, one of the most important astronomers then living and a practising Quaker, gave a lecture to British Quakers of which this short book is the text. Although the book can easily be read at one sitting, many might question the value of spending even that amount of time on it. Scientific cosmology was in its infancy in 1929, despite Eddington’s own pioneering efforts; Lemaître in Belgium and Friedmann in Russia were only just feeling their way to what would become known as “Big-Bang” cosmology—a term and a theory that Eddington would have disliked. The source of stellar energy would not be known for nearly another decade, and Eddington subscribed to a theory of the origin of the solar system that is no longer considered likely. The only sub-atomic particles known were the proton and the electron. In the biological sciences, the so-called modern synthesis of Darwinian evolution and Mendelian genetics was only just beginning to emerge, and the structure of DNA would not be known for nearly another quarter of a century. Religiously speaking, Eddington belonged to what is still a minority group of Christians, when few in the West knew much about non-Christian religions. Can even Eddington’s opinions about the relation of science and religion survive the changes in both fields of the intervening years? I believe they can; Eddington’s insights were so profound that they can still challenge us today: the book is a little gem, and deserves the status of a minor classic.

The phrase “unseen world” was commonly used in Eddington’s day by those who believed in a world of spirit as well as the physical universe. Eddington certainly shared that belief, which fitted well with his conviction, elaborated in other books, that we can know only something of the structure of the physical universe but not what Kant called “things in themselves”. He also believed that we could deduce that structure by pure reasoning, without recourse to experiment. This last feature in his thought was and is, of course, highly controversial and is rejected by the overwhelming majority of scientists, but it is of a piece with Eddington’s own rejection of a materialist philosophy. Eddington’s criticism of the equating
of mind and brain (Section III, pp. 18–25) are still to the point today, despite our much greater knowledge of the working of the brain.

There was no conflict in Eddington’s mind between his science and the unseen world, because both were open to investigation by the human mind, and in each realm he was seeking, but not expecting, or even wishing, to achieve a “theory of everything” (p. 16). “In science as in religion” he wrote “the truth shines ahead as a beacon showing us the path; we do not ask to attain it; it is better far that we be permitted to seek.” His emphasis on seeking was related to the Quaker indifference to formal creeds. To him, the recitation of a creed as an act of worship seemed as unnatural as would the profession of adherence to Newton’s laws of mechanics and Clerk Maxwell’s laws of electromagnetism by a science class at the beginning of a lecture (p. 54). On the other hand, he defended the idea of a personal God (pp. 49–50) on the grounds that he saw it as “the very essence of the unseen world that the concept of personality should dominate it.” Here is an interesting difference from Einstein who, to the end of his life, denied the existence of a personal God. That may seem surprising given the number of times Einstein referred to God, but I suspect that he did not make so clear a distinction in his mind between a personal God and an anthropomorphic one as Eddington did in this book.

This concept of seeking was the unifying factor in all Eddington’s work, as has been well brought out in a recent study by Matthew Stanley (2007). It led Eddington towards the end of his book (p. 54) to what I believe is one of the most profound statements on the relation of science and religion that anyone has yet made: “You will understand the true spirit neither of science nor religion unless seeking is placed in the forefront.” That is a statement that many believers would do well to take to heart and that even some scientists tend to forget; for it alone, I commend this little book to readers of this journal.

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Reference


Did you know that “the personality” of the familiar garden bird, the great tit, has been given “what amount(s) to a personality test?” Or that “the personality characteristics” of the mischievous little fish, the guppy, have been studied
intensely? Or that the lowly amoeba is acting on “positive emotions” when it
tracks and ingests food?

All of this, and more, seems credible, relevant and meaningful to Daniel Nettle,
a Reader in Psychology at the University of Newcastle, the author of Personality,
which is his attempt to explain “what makes you the way you are.” An enthusiastic
adherent of the currently popular five-factor model of personality, Nettle offers
a mish-mash of evolutionary notions, neuroscience and behavioral genetics to
bolster the theory.

In an early chapter, we learn that the beak of the finch mutates according to
ecological conditions, that the aforementioned guppy’s “personality dimension is
tantalizingly similar to human Neuroticism” (p. 78), and that “personality traits
in humans are heritable, just as beak size in finches is.” (p. 55) Then, in five
individual chapters, he addresses each of the factors—extraversion, neuroticism,
conscientiousness, agreeableness and openness—as they relate to what sound like
contrived clinical vignettes.

Nettle does all of this with a confidence that broaches on evangelical arrogance
repeatedly telling the reader that “we know.” However, the “we” he speaks of does
not include the general reader or even all other psychologists but refers rather
to those like-minded individuals he deems to be “academically respectable
psychologists.” (p. 17) Having survived over 2 millennia of darkness in which
“the field of personality research has been plagued by different people using
different notions,” Nettle believes that now “we psychologists . . . at last have a set
of personality concepts that is firmly based on evidence.” (p. 9)

Relegated to the dustbin are the antiques of Hippocrates’ four temperaments,
“Melancholic,” “Sanguine,” “Choleric,” and “Phlegmatic,” each described
according to a human body fluid; Sheldon’s three human temperament types or
somatotypes based on the three tissue layers, endoderm, mesoderm, and ecto-
derm; and Pavlov’s two-factor model of “extremeness” and “passivity.” Similarly
swept aside are Meyers and Briggs’ “Type Indicator” (MBTI), Cattell’s 16 Per-
sonality Factors (16PF) and multitudes of other specific and general personality
models. Now, thanks to the innovation of “self report” rating systems (he offers a
12-item questionnaire to assess the reader’s personality) and the “modern com-
puter” which can do factor analysis “in less than a second,” Nettles proclaims that
“we can quickly tidy the field up.” While this tidying-up loses “a lot of informa-
tion,” he feels that the benefits of “reducing and simplifying the data” outweigh
the costs despite Einstein’s caution that “things should be made as simple as
possible, but not simpler.” The amazing result is the Five Factor model: “the
Christmas Tree” on which “all particular findings can be arranged” to satisfy
Nettle’s vision.

But this particular Christmas tree seems chintzy, laden with too many artificial,
ornamental notions. While Nettle defines personality traits as “stable individual
differences in the reactivity of mental mechanisms” (p. 43), and “a way of
being . . . with consequences for life outcomes” (p. 48), he proceeds to stretch the
concept beyond reason describing how specific behaviours of birds, mice and
even the aforementioned lowly amoeba have their own personality characteristics.
Muddling evolutionary processes, adaptation and situation-specific response patterns, he tries to explain such things as why women score higher in Agreeableness (“because the female response to threat is (to) ‘tend-and-befriend’”) while the lower-scoring male is more suited to the aggressive style of business executive positions.

As for higher scorers in Extraversion, Nettle states that they enjoy sex and romance, have a greater number of sexual partners and casual matings, and like active sports, travel and novelty, all of which he ties to their pursuit of positive emotions (joy, desire, enthusiasm and excitement). However, he believes a dimension rather like Extraversion can be found “even in the spineless octopus.”

When it comes to Neuroticism, greater “negative emotion” is the key that may find its expression in a wide variety of disorders including anxiety disorders, phobias, insomnia, low self-esteem, eating disorders, Post-Traumatic Stress Disorder, and Obsessive Compulsive Disorder (p. 117). Depression, he conjectures, is the “flare up of the underlying personality trait.” If there is a good side to this factor it is that it may discourage them from high risk-taking activities such as mountain climbing (he notes that “Climbing Everest is a very dangerous thing to do”) and may foster creativity, since many artists and writers show clear signs of depression and Neuroticism (p. 125).

Conscientiousness, Nettle defines as “the magnitude of reactivity of those mechanisms in the frontal lobe that serve to inhibit an immediate response in favour of a goal or rule.” Somehow, from this the author is able to conclude that low scorers are more inclined to drinking, drug use, gambling and law-breaking, where as high-scorers risk having Obsessive Compulsive Personality Disorder.

Perhaps unsettled by the idea that our brains are “wired” for these disorders and that our personalities have been predetermined by genetics and “early life influences,” he concludes the book with a feel-better chapter on how readers can give it a better “spin”—although it backhands those individuals with the diagnosis of high levels of Neuroticism. Here Nettle suggests strategies ranging from “exercise, yoga, and meditation, through cognitive behaviour therapy, to antidepressants and anti-anxiety medications.” (pp. 242–243)

While the book abounds in such concocted and absurd examples of the interplay of these five factors with evolutionary theory, genetic and brain studies, one more deserves attention. Nettle states that “evolution (has) built into us a capacity to modulate our personalities in response to our health, intelligence, size, and attractiveness.” He continues: “For men, Extraversion increases with overall size, though this is not the case for women. This makes sense too, since perceived attractiveness and desirability increase with height for men, but not necessarily for women. Larger men also seem to be slightly less nice, on average, and men with antisocial personality disorder are rather larger overall. This is probably because large men have a much greater chance of getting away with the kind of persistent rule-breaking and confrontation that this disorder entails than more diminutive individuals have.” (p. 231)
If this conjecture makes sense to you, you will enjoy the convoluted thinking of this author. If not, forget the book!

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During the 20 years since the first of Jacques Vallee’s classic “alien contact trilogy” was first published, much has changed in ufology. Abduction research was just starting to blossom at the time, with researchers such as Budd Hopkins and Whitley Strieber having published their first popular books on the subject, while the iconoclastic John Mack was still to have come to the fore and had his voice silenced all in a short period of time.

Over the past several years, governments of countries such as France, Mexico and Britain have become somewhat more transparent in their release of UFO-related documents. At the same time, there has been a shift in ufology away from detailed investigation of current cases (with a few notable exceptions such as Chicago-O’Hare and Stephenville) towards the re-examination of historical cases and themes.

In terms of the current thinking about the nature of UFOs, ufology (especially American ufology) has become more focused on the extraterrestrial hypothesis (ETH) and this has been significantly enhanced by the media’s resurgence of interest in UFOs as alien spaceships. Indeed, this has led indirectly to the proliferation on YouTube and other social media websites of videos of UFOs, usually described as alien spacecraft by breathless witnesses. Many of these are obvious fakes or astronomical objects, but they serve to bolster the public’s opinion that aliens are visiting Earth.

With this in mind, it is fascinating to revisit a different perspective on the UFO phenomenon as laid out in the 1980s by Vallee in a remarkable series of books: Dimensions (1988), Confrontations (1990) and Revelations (1991). Presented in a logical, coherent sequence (and with thematically attractive new covers), Vallee makes his case for his position that the UFO phenomenon is not extraterrestrial,
but terrestrial in nature, and not simply physical, but psychosocial in character. This is completely antithetical to popular belief about UFOs, and it is refreshing to revisit Vallee’s writings for a different slant on what may be going on. Indeed, many currently active ufologists may not have read Vallee’s works and are unaware of other perspectives on the phenomenon.

Vallee starts his exploration of the “ultraterrestrial hypothesis” (UTH) in Dimensions by showing through an exhaustive collection of case data and examples how “modern” UFO reports are similar to myths, legends and folktales. These have been part of human history and culture for millennia and Vallee argues that this is not coincidence, but evidence that aliens, leprechauns, sprites and other legendary creatures are differing interpretations of the same entities. This follows as a condensation of his earlier Passport to Magonia, which introduced readers literally to a new dimension of ufological thought.

He notes early in Dimensions: “Perhaps they [the aliens] have always been here. On Earth. With us.” (p. xi)

Vallee notes how governments have generally looked the other way or ignored witnesses’ detailed observations of strange craft, sometimes covering up or explaining away the sightings. He even cites what is likely the first government investigation and cover-up of UFOs, not in the 1950s but in 1235, when a Japanese general and his troops witnessed formations of moving lights in the night sky and launched a “scientific investigation.” In parallel to recent official efforts, the general’s consultants reported back that the objects were only natural phenomena, in this case the “wind making the stars sway.” (pp. 11–12) Sadly, the lack of references or index in this volume is frustrating and is perhaps the major flaw in the entire trilogy, leaving the reader eager to find more about some of the stories and cases noted.

Vallee spends most of Dimensions showing parallels between contemporary UFO cases and historical or legendary tales. For example, in his discussion of the classic case of Joe Simonton who was given “pancakes” by space visitors in 1961, Vallee notes ancient stories about “the Gentry” who would occasionally appear to unsuspecting Irishmen and offer food and nourishment that were enchanted and cause commotion. These fairy-folk would often whisk away humans for tours of strange lands only to bring them back to have their victims find that many hours, days or years have apparently elapsed, reminding one of modern-day abductees’ and contactees’ experiences.

One of the most curious sections in Dimensions is a further comparison between ufonauts and fairy-folk with regard to sexual behaviour. Vallee notes that folklore often is “watered-down” for the masses and its “adult content” is often lost. But the well-known case of Antonio Villas-Boas in Brazil in 1957 where he had intimate contact with an alien female is similar to legends of demonic sexual encounters as described in religious and mystical texts dating back well before the Middle Ages.

These and other examples lead Vallee to bluntly note:
... the UFO phenomenon does not give evidence of being extraterrestrial at all. Instead, it appears to be inter-dimensional and to manipulate physical realities outside of our own space-time continuum. (*Dimensions*, p. 136)

Vallee admits openly that his theories are not for everyone. Indeed, he recommends most people should:

... subscribe to the magazines that “prove” that “flying saucers are real and from outer space.” I am not writing for such people, but for those few who have gone through all this and have graduated to a higher, clearer level of perception of the total meaning of that tenuous dream that underlies the many nightmares of human history. . . . (*Dimensions*, p. 163)

Far from arguing against the ETH, he notes that:

... the universe might contain intelligent creatures exhibiting such an organization that no model of it could be constructed on the basis of current human concepts. . . . The behaviour of such beings would necessarily appear random or absurd or would go undetected. . . . (*Dimensions*, p. 164)

And yet, Vallee insists, UFO phenomena that are strange and unusual and defy science are nonetheless “real.” For the noted Fatima religious manifestations of 1917, he cites scholarly analyses that noted:

The phenomenon, which no astronomical observatory registered and which therefore was not natural, was witnessed by persons of all categories and of social classes, believers and unbelievers, journalists of the principal Portuguese newspaper and even by persons some miles away. Facts which annul any explanation of collective illusion. (*Dimensions*, p. 196)

Vallee details many classic steps in the development of ufology, from J. Allen Hynek’s infamous “swamp gas” remarks to the irresponsible Condon Committee fiasco. However, he challenges the “spacecraft theory” at every opportunity. He notes:

In ufology, either you are a debunker who doesn’t believe in UFOs at all or you agree they are spacecraft from another planet. But are these necessarily the only two possibilities? (*Dimensions*, p. 256)

One wonders if anything has changed since he asked this question. He finally conjectures:

I propose that there is a spiritual control system for human consciousness and that paranormal phenomena like UFOs are one of its manifestations. (*Dimensions*, p. 272)

and:

I suggest that it is human belief that is being controlled and conditioned. (*Dimensions*, p. 276)

Between 1980 and 1987, Vallee, an iconic figure in ufology, all but vanished from the UFO scene. He was very influential and involved during the formative years of ufology; he was even caricatured as a character in the Steven Spielberg movie *Close Encounters of the Third Kind*. Yet, he pulled back, and researchers
wondered what had become of their ufological role model. It turned out that during that time, he began analyzing and categorizing UFO data, consulting with experts in various fields and personally doing onsite field investigating of cases around the world. He stayed away from the abduction controversy, believing it to be in the hands of unqualified believers or those with set agendas. He stayed away from UFO conventions so he could avoid being frustrated by hardcore nuts-and-bolts ETH adherents.

*Confrontations* is the documentation and result of his work during this time, expounding on his views of the state of ufology, science and rationalism. Here, he charges that debunkers themselves are the main reason why the public rejects science. By refusing to openly study UFOs, science itself drives many sincere witnesses into cults like Jonestown, while skeptics, who flatly deny the existence of any unexplained phenomenon in the name of “rationalism,” are among the primary contributors to the rejection of science by the public. (*Confrontations*, p. 21)

Vallee notes the significant difference with *Confrontations* as opposed to other works on UFOs is that the information contained within it comes from his personal investigations and first-hand sources. He presents a UFO photo case he studied in Costa Rica, a multiple-witness UFO case he researched in Northern California, and a UFO-related death he investigated in Argentina. He questions basic UFO investigation methodology (such as it is) and admits arriving at a point where he does not know what happened to some UFO witnesses, even to the point of being “not even sure they had seen a UFO at all!” (*Confrontations*, p. 87).

He is highly critical of the UFO field itself, and lambastes UFO investigators who are too taken up in fervour to treat witnesses with respect and dignity.

In their eagerness to obtain definite answers, or simply to validate their own preconceptions about the extraterrestrial nature of the phenomenon, many investigators rush in, demanding answers, where they should first try to attend to the trauma and the stress surrounding the witnesses . . . the number of untrained, unqualified hypnotists roaming the countryside in the name of UFO research has greatly multiplied. (*Confrontations*, p. 93)

Ironically (or likely intentionally), the title of this book has less to do with encounters with aliens than with ufologists and other “experts” themselves. In fact, the subtitular “alien contact” is essentially a red herring in terms of what Vallee is trying to get across to readers; aliens may not be involved at all. Vallee goes to great length to dispel popular concepts about the UFO phenomenon and show that there is much more going on than “simply” alien spacecraft. To him, researchers and investigators themselves appear to be shooting themselves in the feet by not taking a step back and examining the subject sensibly and at a distance.

Yet how can ufologists view such things as *chupas*, the mysterious beings who attacked villagers in the Amazon delta with beams of light causing pain, injury and death? Vallee studied many cases of these and concluded that they were likely not alien intruders, but something else. (We know of them now as *chupacapras,*
but that’s another matter.) He notes bitterly that in America, ufologists tended to ignore or deride his theories on the non-ETH nature of UFOs, whereas in Europe, the reaction was diametrically opposite:

... everything was folklore and there was no physical reality behind the sightings at all. (Confrontations, p. 178)

Here, Vallee hints at his suspicions that a secret or clandestine government or military organization is manipulating or otherwise obfuscating UFO reality. To wit:

Somebody in the United States owns a collection of records that contains the proof of the reality of the phenomenon. (Confrontations, p. 225)

The most significant part of Confrontations, however, is the Appendix, in which Vallee details his new classification system for UFO reports. He suggests 20 categories of cases with an additional 15 descriptors that note a case’s reliability, depth of investigation and explanation. His scheme is marvelous and encompasses everything from physical effects, nearness to observers, reality transformation and even injury or death.

However, adopting Vallee’s system has not been universal to say the least. In fact, it has largely been ignored except for a few experiments such as that by Ufology Research of Manitoba in the early 1990s in its yearly analysis of Canadian UFO reports. (Later analyses reverted back to an expanded, easier to use Hynek classification system.)

The third book in this series is Revelations, in which Vallee explicitly states his view that:

... some UFO sightings are covert experiments in the manipulation of the belief systems of the public. And some cases simply did not happen. (Revelations, p. 8)

Vallee describes his involvement with the notorious Holloman UFO video promised to film producer Robert Emenegger in 1974, for which no adequate provenance was ever provided. He drove to Norton AFB in 1985 on another occasion to meet with military officials who described close encounters with UFOs, but provided no evidence whatsoever.

Vallee notes his disgust with the “revoltingly amateurish Strawberry Ice Cream Show” of 1988, in which a major TV network aired a ridiculous “tell-all” program about military involvement in the UFO phenomenon. During its presentation, an “informant” told the world that captured aliens at a secret American base preferred a particular confectionary over another.

Vallee goes after UMMO, an obvious conglomeration of UFO nonsense and finds it embedded in controversy and mystery, but possibly related to the intelligence community! He then relates the classic Rendlesham case of 1980 and suggests that:

... the most plausible theory is that the U.S. military has developed a device or a collection of devices that look like flying saucers, that are primarily intended for psychological warfare, and that they are being actively tested on military personnel. (Revelations, p. 157)
His final thesis is:

My tentative answer is contained in the following scenario. Suppose that for the last thirty years or so a massive effort has been going on within U.S. government agencies such as the CIA, the NRO, and the Air Force, to study the UFO phenomenon. Not in an attempt to really solve it, since a solution is still beyond the reach of our science, but in an effort to use it, to manipulate it as a cover for something else. (*Revelations*, p. 229)

In essence, then, in this trilogy of ufological exposition, Vallee does several important things towards the advancement of ufology. First, he provides data to show that the UFO phenomenon is real and has been part of human history for millennia. Second, he emphasizes that it is an absurd phenomenon that does not seem to be conformable to simple scientific categorization. Third, he shows that current approaches by both debunkers and believers fail to address the complex nature of the phenomenon and do a great disservice to its witnesses. Fourth, he suggests a methodology that may be more useful in understanding the phenomenon. And fifth, he theorizes that a clandestine organization, military or otherwise, is obscuring the nature of the phenomenon to its own end.

This view is at odds with the popular view that UFOs are alien spacecraft. Vallee’s relatively radical ideas have been largely shoved aside by mainstream ufology for their critical nature and their complexity. Perhaps some ufologists would prefer that the UFO phenomenon was simply extraterrestrial. It might be easier to accept that an advanced civilization was sending scout ships in Earth’s direction rather than speculate that multi-dimensional beings ride beams of light and can enter our dreams.

And yet, the ETH is not completely satisfying. Why don’t we have more physical evidence of aliens’ presence? Why hasn’t contact been open and pervasive? And why do the government and the scientific community seem so hell-bent on ignoring evidence of alien visitation?

Vallee answers, “Because it’s not just aliens.” It’s us.

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The question I had, as I began reading this book, was when does anecdotal evidence turn into scientific observation. Skeptics will tell us that this book is loaded with the same kind of anecdotal evidence that has plagued studies of the
UFO phenomena for nearly three-quarters of a century. But here we’re dealing with the observations of men trained to fly, who understand the sky and what is in it around them because their lives depended on it, and who are certainly not given to hysterical hallucinations. Chester gives us the documents created at the time by intelligence officers trained in interrogation techniques and whose job it was to understand all that the flight crews were telling them because lives hung in the balance.

This, I think moves these observations from the realm of the anecdotal to that of professional, as valid as any a scientist might make. True, some of the stories were related by the men decades after the events, but much of it comes from the documents created at the time and we see a phenomenon that went unexplained then and remains unexplained now.

As I began reading *Strange Company*, I wondered whether we would be treated with a series of stories of indistinct blobs of light, which, I confess, was my concept of the foo fighters of World War II. I thought of them as something maybe no more that 2 or 3 feet in diameter which suggested something more akin to ball lightning or St. Elmo’s Fire than a physical craft. But we read of solid objects with sharply defined edges moving the foo fighters from the realm of ionized air and other natural phenomena into something that is solid and probably extraterrestrial.

I wondered if anyone fired on the objects and in the very beginning we’re given a discussion of the “Battle of Los Angeles” in early 1942 when anti-aircraft batteries opened fire on what might have been hallucinations created by war nerves. Chester does present documents from the highest levels of the Army that suggest something more real might have been responsible for the hysteria. I’m not sure that he proves it was anything other than war nerves, but this is a minor criticism, certainly not based on the presentation of documentation in the book. Besides, it could be argued that the explanation was pushed to quiet the hysteria that was infecting the west coast in 1942.

I wondered if anyone would report on what happened to the rounds fired at a foo fighter. Chester details one specific mission in which the object was shot at by machine guns in various positions on the aircraft and the rounds were seen to disappear into the haze around the foo fighter. The bullets never emerged, suggesting that the light, the object, the foo fighter, whatever it was, absorbed the machine gun bullets. Certainly something as ephemeral as a foo fighter would allow the shots to pass right through it if it was nothing more than ionized air.

And he gives us other accounts of the soldiers, the airmen, shooting at the objects, always without observable response. These rounds, some of them 50 caliber or higher do nothing to foo fighters. Sometimes they pass through and sometimes the rounds just disappear.

The one problem I had with the book was that it was quite reminiscent of those UFO books from the 1960s and 1970s that recounted sighting after sighting, which, I suppose, might be the point. This was a compilation of sightings, but
unlike those earlier books, this book lists the names of witnesses and the official documents in which their sightings can be found. It adds a note of realism to *Strange Company* that is not found in those earlier works.

For those interested in the Roswell UFO crash, some of the participants in those discussions show up. Most notably is Colonel Howard McCoy, who, after the Roswell crash, would say in a meeting in which the minutes were recorded and later declassified and released that they had no crash recovered debris. Here it becomes clear that McCoy was involved in the UFO phenomena since World War II, when he was one of the top officers investigating foo fighters.

And William Blanchard, the commanding officer in Roswell but then commander of the 40th Bomb Group, appears. I wouldn’t mention this, except that during the October 25, 1944 mission, three of his B-29 crews reported high-altitude balloons on three separate occasions. About 3½ years later, a high altitude balloon called Mogul allegedly would fool Blanchard’s intelligence officer. Makes you wonder what it is about Blanchard and high altitude balloons.

For those who wish to pick nits, I found some minor mistakes that hardly deserve comment. On page 66, for example, Chester identified Lt. General Walter Bedell Smith as the U.S. Army Chief of Staff. In 1944, that was George Marshall. Smith was the Chief of Staff at SHAEF. On page 114 he has a picture of a soldier with a caption saying that he is receiving the Distinguished Flying Cross but the medal in the picture is clearly the Air Medal. As I say, minor things that suggest only that Chester and his editors weren’t familiar with these nuances and this is something that really doesn’t detract from the book. Skeptics might leap at something like this but it really is trivial.

This also tells us that this book is a unique history of the Second World War. We see the inside operations of some of the intelligence missions and intelligence gathering during the war. What is fascinating is seeing how they deal with the possibility that the enemy is deploying some kind of new weapons system and how they gather all that information. We also see, to a limited extent, the attempts to stop the Nazis from using the V-1s and V-2s against the British.

What *Strange Company* does quite well is move the modern era of the UFO from June 1947 when Kenneth Arnold’s report hit the newspapers to World War II. It is clear that these sightings, considered at the time to be classified information and therefore weren’t widely discussed, are the beginning of the modern era. This is a book that is required in the library of every UFO researcher because it supplies a new and different perspective to UFOs. They didn’t arrive 2 years after the atomic blasts in New Mexico and Japan, but as the war raged around the world. They followed aircraft, task groups, and flew over infantry emplacements. They were studying us at war and probably seeing us at our very worst. But they were here, and this book goes a long way in proving it.

Maybe Captain William Mandel described it best in a letter he sent to J. Allen Hynek in 1967: “The most interesting point to be considered, I think, is that not until several years later did I first hear of the terms ‘flying saucer’ and ‘UFO,’ nor was I aware that others before me had recorded similar sightings. It certainly
did not occur to me at the time that I might be witnessing the passage of an interplanetary vehicle.”

And because of that, and the belief that the foo fighters were some kind of enemy weapon system, these sightings haven’t been thought of as part of the UFO history. Chester has now corrected that misconception requiring all of us to reevaluate all these sightings. In this Chester has performed a valuable service and should be commended for it.

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Avraham Ariel is an Israeli freelance writer and businessman with much experience of ships and the sea. Nora Ariel Berger works in the field of business media in New York. Together, they have written a fairly light book on the nature and history of measuring and mapping the earth in terms of the earth grid—that is, lines of latitude and longitude, including the equator, the prime meridian, and the International Date Line, beginning with Antiquity and moving forward through later history. In this review, we are concerned almost exclusively with the book’s Chapter 13 (pp. 163–185), “Who Did It First?”—that is, who first crossed the equator by ship. Of course, skippers and crews of many local equatorial-area watercraft did so routinely, from time immemorial, but the authors mean a crossing via a significant historically documented voyage—which translates to: Who from Europe, North Africa, or Asia is earliest recorded as having done it.

The Holy Bible’s Old Testament more than once mentions a distant land called Ophir, where “gold, and silver, ivory, and apes, and peacocks” (1 Kings 10:22, RSV) were obtained; kings Solomon of Israel (ca. 973–ca. 933 B.C.) and Hiram of Phoenicia’s Tyre (989?–936 B.C.) sent joint trading fleets there every three years. According to the authors, the “simple and irrefutable conclusion” is that the sailors involved had to go southward at least as far as Kenya in East Africa to where these products occurred and that, therefore, these mariners are the first recorded as crossing the line. But what Ariel and Berger claim to be simple and irrefutable is, in fact, far from being either. First, there has been debate as to the true translations of the names of the products concerned (see, e.g., Lancel, 1995: 9). In any case, the Phoenician ships involved could have obtained these
things from middlemen at some entrepot in southern Arabia’s Sheba (Saba, present Yemen) or elsewhere far to the north of the equator rather than directly from the products’ homelands. Further, the Indian subcontinent is a much more likely original source area for the items named than is Africa, owing to the fact that all of the products mentioned exist there, with the qualification that although monkeys are common anthropoid apes are absent. Further, the peafowl is a South Asian species and is not native to Africa. Another verse of 1 Kings (10:11), not cited in the book under review, mentions two more products: precious stones, for which India (but not Africa) was famous, and logs of the almug (“sandalwood”) tree, another southern Indian export. Note, too, that tradition and customs indicate that Jews settled on the coast of India’s Maharashtra state circa 800 B.C., which supports the idea that biblical Ophir of the tenth century B.C. was in India; the Hebrew names of some of India’s products—‘ivory’, ‘peacock’, ‘sandalwood’—appear to have Tamil roots, Tamil being a Dravidian language of South India (Gupta, 2001). Similarly, the Phoenicians’ Canaanite language also incorporated Tamil words for certain objects (Selimkhoanov, 1996–1997). If Ophir was indeed in India, then the fleets of Solomon and Hiram did not cross the equator when sailing there, for the line lies well to the south of the subcontinent.

The authors next tackle Herodotus’s report that, a couple of centuries earlier than he was writing, the Egyptian pharaoh Necho II (Nekau, 610–594 B.C.) had sent out a Phoenician Red Sea fleet that successfully circumnavigated Africa. Ariel and Berger state that historians dismiss this story because important facts that would have been included in a genuine account were omitted. Yet, why should we suppose that Herodotus’s source had necessarily related every relevant fact to the Greek historian, or that the latter got everything important told to him down on papyrus? Herodotus himself was skeptical of the tale, because it mentioned the sun’s being on the right hand when the ships were rounding Africa’s tip; yet, later scholars have pointed to this as evidence that the fleet really had been in the Southern Hemisphere. The authors of Plotting the Globe, reveling in “debunking,” say that pro-authenticity “Sensation-seeking scholars clutch at every clue, vague as it may be, in order to support their case. When the evidence is not there—they have no qualms about fabricating it or its interpretation.” “Serious—and cautious scholars” conclude that the voyage crossed the equator south of Somalia but “dismiss the circumnavigation story,” which was promulgated by Phoenicians, some of “the greatest liars, in history” (p. 168). Ariel and Berger point out that from anywhere south of the Tropic of Cancer, at the proper time during the summer one could experience the sun’s being to the north; one does not have to cross the equator to be south of the sun’s apogee. (They also aver that there is insufficient evidence to support the conjecture that Phoenicians discovered the Madeira Islands [p. 197]).

The Carthaginians of North Africa were Phoenician descendants and were also great liars, according to this book. The writers are extremely cautious as to to what extent they should credit the well-known story of Carthaginian chief magistrate Hanno’s voyage out through the Strait of Gibraltar and down the West African coast. First, they point out that the 60 ships mentioned in the account could
not have carried anything close to the 30,000 colonists supposedly on board. Ariel and Berger assert that those scholars who accept Hanno’s story are making a “Science-fiction interpretation in order to prove their fallacious and sensational theories . . . to buy themselves some fame” (p. 171). But we don’t have the original of the relevant document, and if, at some point, a抄ist misread 3,000 as 30,000, then each ship would have transported not 500 but 50 colonists, a reasonable figure. Cautious scholars, the authors say, estimate an average ship speed of 4.8 kilometers (3 miles) per hour and conclude that the expedition went no farther than Sierra Leone (and thus far short of the equator), whereas more reckless writers posit a speed of 9.7 kilometers (6 miles) per hour and identify the voyage’s farthest point reached as having been a fiery volcano in Cameroon. But, warn the authors, 9.7 kilometers per hour is an unrealistically rapid speed, and maybe no volcano was seen, only grasses afire during the seasonal burning intended to improve forage for animals. Hairy little “men” called gorillae were reported, but these could have been baboons in Sierra Leone, not what today are called gorillas in equatorial Africa. Even Pygmies, say the authors, could have been meant—but Pygmies are not hairy. Even Cameroon is a bit short of the equator, so Hanno is eliminated from the “contest.”

In disparaging open-minded scholars’ conclusions, Ariel and Berger are apparently classing authors of standard books on ancient science, geography, and exploration such as Walter Woodburn Hyde (1947) and George Sarton (1970) as self-serving fantasists and fabricators, at least as far as the voyages of Necho’s and Hanno’s fleets are concerned, because these academics acknowledged the possible reality of the interpretations derided above.

The book then considers the possibility that one or more of the voyages of the early-fifteenth-century Chinese admiral Zheng He reached latitudes beyond the equator, but finds the dimensions of the giant “treasure ships” described on memorials to Zheng and his voyages to be beyond belief: not only would the ships have been too large to be built by available methods, but also the beam would have been very much wider in proportion to length than is the norm in naval architecture. And, the writers ask, why, if these voyages really took place, were there no impacts in the lands to which they went, no stories of the visits told in those countries, and no Chinese artifacts or wrecks there. Since very little nautical archaeology has been undertaken in the Indian Ocean or China seas, a dearth of known wrecks should not be surprising. What is surprising is the authors’ statement that: “[T]he remains of not a single Chinese ship of that era have ever been found” (p. 206). Of course, Gavin Menzies (2002) has provided piles of what he thinks is evidence of the impacts of these voyages, but Plotting the Globe’s authors consider Menzies’ scenario to be “science fiction” (p. 177). Granted that Menzies has vastly overreached (see Jett [2003] review in Journal of Scientific Exploration), nevertheless he does discuss a verified Chinese wreck of 1423, found at Pandanan, at 8 degrees north latitude off Palawan in the Philippine Islands, and alleges many more elsewhere (Menzies, 2002: 227–228). And, another known wreck, from Quanzhou in South China, dates to about A.D. 1400 (Green, 1996: 161). In fact, in 1962 an actual rudderpost from one of the Ming
treasure ships was discovered archaeologically and is so enormous (11 meters/33.5 feet long) that it implies a ship between 146 and 163 meters (479 and 535 feet) in length (Ronan, 1986: 123–124). I know of no historian who doubts the reality of Zheng He’s treasure fleets or that they completed several long-distance expeditions. According to the records of the voyages, their ports of call included Java and Kenya, both of which are to the south of the equator (see Levathes, 1996).

Thus, Ariel and Berger’s Chapter 13 minimizes the long voyages of Antiquity, other than the Israeli ones to Ophir—which the authors say, almost certainly erroneously, crossed the equator. As seen in the following chapter, by so doing they allow the Portuguese—traditionally, recognized as the first to have crossed the line—to retain their perceived post-Solomonic priority.

All in all, although it raises a few legitimate questions I would evaluate Chapter 13 of Ariel and Berger’s Plotting the Globe as being fairly shallow in content and analysis, excessively skeptical in outlook, and smugly sneering in tone. And, a price tag of almost $50.00 is certainly a disincentive to purchase.

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Note

1 This review also appeared in 2007 in Pre-Columbiana: A Journal of Long-Distance Contacts, 4(2).

References


*Webster’s II New Riverside Dictionary* (1984) defines the term *shaman* as: “A priest who uses magic to foretell and control events and to cure the sick” (p. 635). Norman Bancroft Hunt’s book on shamanism, which is based on his own field research on the topic among Native American tribal cultures, shows that the role of the shaman in these cultures is actually broader than this. The book provides a valuable overview of shamanistic history, tools, practices, and beliefs within seven tribal regions found across North America, outlining the various roles that the shaman can take in tribal life (which include diviner, dream interpreter, therapist, artist, craft maker, trickster, warlord, and historian).

Though the details vary among tribes, most Native Americans have long held the belief that the physical and biological elements found in the natural world, as well as the forces of nature, are guided by deity-like spirits inherent in their spiritual traditions of creation. To help ensure that these elements and forces are balanced in a way beneficial to the tribe’s survival, shamans are often asked to partake in rituals designed to honor the spirits on behalf of the tribe. Bancroft Hunt gives a basic view into these rituals through general description, coupled in certain places by intriguing anecdotes from historical and anthropological sources. Although the text reads as general as a textbook (likely because of its broad survey of many tribes), it still offers the reader with a useful insight. In addition, the pages are richly illustrated with photographs of artifacts that supplement the text.

Although the book will appeal mostly to anthropologists, archaeologists, and historians, it might also appeal to some parapsychologists and practitioners of alternative medicine because of its consideration of some psi-related and distant healing phenomena. For example, some Arctic tribes believe that the soul is capable of detaching from the body, allowing astral excursions similar to the out-of-body experience (pp. 13, 18, 23). Eskimo, Aleutian, and Sub-arctic shamans make use of controlled dreaming to locate animals and distant resources (pp. 22, 67), akin to clairvoyance and remote viewing. They may also use a technique similar to trance mediumship to impart messages from the deity-like spirits to the tribe (p. 24). Navajo tribal healers may use hand trembling to diagnose illness (p. 128), akin to ESP through motor automatism. Other psi-related aspects of Southwestern tribal traditions have been noted elsewhere (Williams, 2007).

Stanley Krippner (2002) points out that Western perspectives on shamanism that have developed over the years have been rather limited and conflicting, and that these issues hinder the contributions that the study of shamanism could potentially make to psychology, medicine, and anthropology. One way to get past these issues and possibly develop a better perspective is simply to return to those sources that directly and more fully survey shamanism in the cultures that have
upheld its tradition for generations. This book should be counted as one of those sources.

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References

**FURTHER BOOKS OF NOTE**


The purpose of the volume briefly noted here is to present an overview of modern experimental parapsychological research. It was written by physician Massimo Biondi, known in parapsychological circles for his previous books on the subject, and by psychologist Patrizio E. Tressoldi, who is also active in his country in parapsychology. The authors propose to present short reviews and to focus their discussion on the empirical database of parapsychology.

After some conceptual discussions about what is not part of parapsychology (UFOs, astrology, miracles), they present a concise but informative discussion of the history of the field. In addition to the work of the Society for Psychical Research and other workers such as René Warcollier and J. B. Rhine, there is also a short review of Italian work. I found this section very interesting, and I hope the authors will enlarge it later into a longer publication.

A chapter on methodology precedes the actual discussion of experimental work. These are presented in chapters about anomalous cognition (including sections about ESP in the ganzfeld, in dreams, and presentiment studies), mind-matter interaction (micro-PK, global consciousness studies, distant healing), and facilitating factors (internal states, experimenter effects, sidereal time).

There is a chapter about a variety of theoretical concepts, including the obligatory mention of entanglement. In another chapter, the authors mention organizations and publications in the field. They end by stating that there are arguments both in favor and against the reality of the phenomena discussed.

The book is fairly complete in coverage. Two topics that could have been added are experimental studies considering global geomagnetic activity, as well as recent studies with mediums. But Biondi and Tressoldi accomplish much in their book, which can be recommended as a good introduction to current experimental work in parapsychology and

I had learned of this book through an article in the Chronicle Review (“Dynamic dissent”, pp. B7–8, 11 July 2008, Chronicle of Higher Education). The article’s statements about resistance to new ideas and the book’s title made it a natural to review for the Journal of Scientific Exploration. But I’ve found it very difficult to review. It’s really an edited monograph of case studies in history and philosophy and sociology of biology, a number of them probably too detailed and academically in-bred to appeal to most readers of this journal. On the other hand, I certainly don’t want to discourage anyone from looking at the book, because it’s brim full of little-known facts as well as opinions by the various authors that are likely to stimulate thought. I came to understand “neutral theory” of evolution better than ever before, for one example. For another, David Hull’s essay on Leon Croizat is exemplary in its clarity, accessibility, and insights into science. (Hull’s book, Science as a Process, is must reading for anyone who wants to understand how science is done.) My chief disappointment is that the Preface promises something cohesive, a taxonomy of iconoclasm, but the book delivers no such thing. I had expected a concluding chapter by the editors, putting into the Preface’s frame the various contributions; instead, there’s an Epilogue by Richard Lewontin that expounds his own views instead of reviewing how the other contributions might add up to more than the simple sum of their parts. Lewontin, an enthusiastic Marxist, focuses on institutional matters and won’t recognize as an iconoclast anyone who hasn’t been publicly effective, which excludes Gregor Mendel, for example, who was certainly a maverick and whose ideas were surely iconoclastic.

The choice of featured characters, too, is not explicitly justified by any coherent concept: Alfred Russell Wallace; Hans Driesch; Wilhelm Johannsen; Raymond Arthur Dart; C. D. Darlington; Richard Goldschmidt; Barbara McClintock; Oswald T. Avery; Roger Sperry; Leon Croizat; Vero Copner Wynne-Edwards; Peter Mitchell; Howard Temin; Motoo Kimura; William D. Hamilton; Carl Woese; Stephen Jay Gould; Thelma Rowell; Daniel S. Simberloff. These hardly live up to the Chronicle article’s description of “19 of the most notable iconoclasts in the last 150 years of biological research”. The book’s Preface indeed steps away from this claim by mentioning a few “who got away”; but why would Stephen Gould be included when Lynn Margulis is not, when Margulis’s long-contested and now universally accepted contribution to evolutionary theory—symbiosis,
bringing a step-wise leap in evolution, creating a new class of organisms—is so dramati-
cally different from mutation-and-selection? For that matter, Carl Woese—whose inclusion
I wouldn’t contest—established the Archaeobacteria as a self-standing group, where
Margulis had discovered how new classes can come about.

But, again, I don’t want to discourage anyone from learning from the mass of factual
material in this book, and the discussions by some of the leading academic pundits of
biology. Just be warned that no striking generalizations emerge; as the editors themselves
remark in the Preface, “all rebels seem to rebel in their own particular fashion”.

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Conversations on Consciousness by Susan Blackmore. New York: Oxford Press,

If you combine 21 of the leading minds on the topic of consciousness, ask them the same
question about the problem of consciousness what will you get? Twenty-one very different
answers.

Susan Blackmore, a senior lecturer in psychology at the University of the West of
England, former parapsychologist, recent author of Conversations on Consciousness and
The Meme Machine, interviews scientists and philosophers who work full-time in the field.
The chapters are question-and-answer style arranged alphabetically by author. Blackmore
starts each discussion by asking, “What’s the problem with consciousness?”

The problem with consciousness within science is that it balks when attempting to
adequately measure and describe a person’s perspective. Science excels at capturing
objective information and quantifying the same. But consciousness, which is by its nature
wholly subjective, creates a stealthy disguise when scrutinized. It’s similar to asking some-
one whether they love their mother without permitting acts of charity or loudly declaring
so to serve as evidence. The feeling part of emotions or a person’s consciousness cannot be
observed or objectively measured.

One way of working around the consciousness issue is by placing consciousness into
a workable scenario. This is done by using the “zombie hunch”. A zombie in this case is
not a corpse reanimated by Voodoo, but a thought experiment that sorts how consciousness
works. The thought experiment asks, “Can a zombie exist that looks like you, talks
like you, acts like you, dresses like you, is identical to you, but has no inner life and no
conscious experience?” Your zombie hunch depends on how you answer the question.

If you say yes, then you see consciousness as separate from the brain and corresponding
neurological functions. The brain is intact, separate from consciousness. If you say no, then
zombies could not exist. You might argue the zombie must have an inner life, a conscious
mind to carry out the normal actions such as walking a dog or typing at a computer.

Consciousness is only one of the topics discussed. Such larger than life icons as
Sir Francis Crick, Vilayanur Ramachandran, best known for his work with synesthesia,
and David Chalmers, who organizes the biennial “Toward a Science of Consciousness,”
all discuss free will, life after death, lucid dreaming, and classical dualism.
Throughout the interviews, each expert explains his or her views on all these topics, but there is no compelling finite answer, no definitive resolution. It will probably be a long time before we see a book titled *Conclusions on Consciousness* with a treatise on whether zombies can exist.

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**ARTICLES OF INTEREST**


Quantum mechanics predicts that in some circumstances an action of one particle will *instantly* change the action of another particle regardless of distance. These two particles are “entangled,” and we know this condition leads to normally impossible things. This business of instant communication between two entangled particles across great gulfs of space is especially unreasonable to humans.

But we can measure “instantly” in the lab and D. Salart and his team devised such a timing experiment in Switzerland. They designed a way to check the actions of quantum-entangled particles separated by 18 miles. The experiment showed that the signals marking the activity of one of the particles were communicated to its entangled partner 18 miles away—if not instantaneously—were traveling at least 10,000 times the speed of light.

From the experiment of Salart et al, Rudolph concluded:

. . . that any theory that tries to explain quantum entanglement by invoking a transmission mechanism will need to be very spooky—spookier perhaps, than quantum mechanics itself.

All actions-at-a-distance have this speed problem. The velocity of gravitational effects has long been a matter of speculation. But we do not know whether the “instantly” attribute of quantum mechanics is the same phenomenon involved in gravitation, magnetism, etc.

Actually all actions at a distance might use different “mechanisms.” It may be that mechanisms are not involved at all, rather something else we do not perceive. Dark matter and dark energy were below our knowledge horizon until just recently—presuming that they exist at all!


Anomalies often pop up in places where scientists thought they had explained everything completely. For example:

It is a well-established fact that the rate at which a collection of radioactive atoms decays, itself decays exponentially over time.
But beneath the “well-established” terrain of radioactive decay there now seem to be periodic earthquakes—at least for two decay schemes put under the physics magnifying glass.

The two decay schemes so far observed for this phenomenon do not merely deviate slightly from the classical smooth exponential curve. Far Worse! Their decay curves oscillate in time! Such periodic deviations from “normality” may betoken a radically new underlying phenomenon complicating what has always thought to be a simple process. The element was Promethium 192.

Neutrinos might be behind this startling radioactive-decay phenomenon, since these ghostly, chargeless, almost massless particles for some unknown reason oscillate between three known types.

But Philip Walker, the author of this article, remarks in this regard: “That explanation itself would raise a host of further questions.”

But the radioactive-decay problem has become much worse in the following second phenomenon:


This article describes two long-running measurements of radioactive-decay rates at recognized scientific institutions that show that some (only some) radioactive elements decay at rates that vary with the earth’s distance from the sun. How could the sun’s distance be involved? During the 1980s, experimenters at Brookhaven National Laboratory saw this effect in the decay of silicon-32. More recently, in the 1990s, the same phenomenon in radium-226 was seen at a German institution.

(Astrologers might be pleased at this news, but nuclear physicists are not.)

Rock solid proof of either phenomenon above would definitely be of “textbook-rewriting” stature in physics.

(It is true that radionuclide decay rates are slightly affected by temperature, pressure, and even the chemical compounds in which they are incorporated.)

Stretching one’s imagination, the apparent solar effect described might be affecting macroscopic time-related phenomena, perhaps something analogous to the Allais-Saxl observations of solar-eclipse effects on pendulum periods.

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Modern sovereignty is anthropocentric, constituted and organized by reference to human beings alone. Although a metaphysical assumption, anthropocentrism is of immense practical import, enabling modern states to command loyalty and resources from
their subjects in pursuit of political projects. It has limits, however, which are brought clearly into view by the authoritative taboo on taking UFOs seriously. UFOs have never been systematically investigated by science or the state, because it is assumed to be known that none are extraterrestrial. Yet, in fact, this is not known, which makes the UFO taboo puzzling given the ET possibility. Drawing on the work of Giorgio Agamben, Michel Foucault, and Jacques Derrida, the puzzle is explained by the functional imperatives of anthropocentric sovereignty, which cannot decide a UFO exception to anthropocentrism while preserving the ability to make such a decision. The UFO can be “known” only by not asking what it is.

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*(Paper available at: www.ufoskeptic.org)*

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Readers are encouraged to submit for possible inclusion here titles of articles in preferably peer reviewed journals (typically, which do not focus on topics about anomalies) that are relevant to issues addressed in JSE. A short commentary should accompany. The articles may be in any language, but the title should be translated into English and the commentary should be in English.