



JOURNAL OF SCIENTIFIC EXPLORATION

A Publication of the Society for Scientific Exploration

(ISSN 0892-3310) published quarterly, and continuously since 1987

Editorial Office: Journal@ScientificExploration.org

Manuscript Submission: <http://journalofscientificexploration.org/index.php/jse/>

Editor in Chief: Stephen E. Braude, University of Maryland Baltimore County

Managing Editor: Kathleen E. Erickson, San Jose State University, California

Assistant Managing Editor: Elissa Hoeger, Princeton, NJ

Associate Editors

Carlos S. Alvarado, Parapsychology Foundation, New York, New York

Imants Barušs, University of Western Ontario, London, Ontario, Canada

Daryl Bem, Ph.D., Cornell University, Ithaca, New York

Robert Bobrow, Stony Brook University, Stony Brook, New York

Jeremy Drake, Harvard Smithsonian Center for Astrophysics, Cambridge, Massachusetts

Michael Ibison, Institute for Advanced Studies, Austin, Texas

Roger D. Nelson, Princeton University, Princeton, New Jersey

Mark Rodeghier, Center for UFO Studies, Chicago, Illinois

Harald Walach, Viadrina European University, Frankfurt, Germany

Publications Committee Chair: Garret Moddel, University of Colorado Boulder

Editorial Board

Dr. Mikel Aickin, University of Arizona, Tucson, AZ

Dr. Steven J. Dick, U.S. Naval Observatory, Washington, DC

Dr. Peter Fenwick, Institute of Psychiatry, London, UK

Dr. Alan Gauld, University of Nottingham, UK

Prof. W. H. Jefferys, University of Texas, Austin, TX

Dr. Wayne B. Jonas, Samuelli Institute, Alexandria, VA

Dr. Michael Levin, Tufts University, Boston, MA

Dr. David C. Pieri, Jet Propulsion Laboratory, Pasadena, CA

Prof. Juan Roederer, University of Alaska Fairbanks, AK

Prof. Peter A. Sturrock, Stanford University, CA

Prof. N. C. Wickramasinghe, Churchill College, UK

SUBSCRIPTIONS & PREVIOUS JOURNAL ISSUES: Order forms on back pages or at scientificexploration.org.

COPYRIGHT: Authors retain copyright. However, when an article has been submitted to the *Journal of Scientific Exploration*, the Journal holds first serial rights. Additionally, the Society has the right to post the published article and make it available via electronic and print subscription. The material must not appear anywhere else (including on an Internet website) until it has been published by the JSE (or rejected). After publication, authors may use the material as they wish but should make appropriate reference to the JSE: Reprinted from [title of article], *Journal of Scientific Exploration*, vol. [x], no. [xx], pp. [xx].

Society for Scientific Exploration <https://www.scientificexploration.org>

Journal of Scientific Exploration (ISSN 0892 3310), an open access, peer reviewed journal, is published quarterly in March, June, September, and December by the Society for Scientific Exploration, P. O. Box 8012 Princeton, NJ 08543 USA. The Journal is free to everyone. Society Members may purchase print subscriptions for \$60 per year. Library print subscriptions are \$165 per year.



JOURNAL OF SCIENTIFIC EXPLORATION

A Publication of the Society for Scientific Exploration

AIMS AND SCOPE: The *Journal of Scientific Exploration* is an Open Access journal, which publishes material consistent with the Society's mission: to provide a professional forum for critical discussion of topics that are for various reasons ignored or studied inadequately within mainstream science, and to promote improved understanding of social and intellectual factors that limit the scope of scientific inquiry. Topics of interest cover a wide spectrum, ranging from apparent anomalies in well-established disciplines to rogue phenomena that seem to belong to no established discipline, as well as philosophical issues about the connections among disciplines. The *Journal* publishes research articles, review articles, essays, commentaries, guest editorials, historical perspectives, obituaries, book reviews, and letters or commentaries pertaining to previously published material.

The *Journal of Scientific Exploration* is a Platinum Open Access journal as of 2018 with a CC-BY-NC Creative Commons license, shared copyright journal:

Platinum Open Access means there are no fees to readers and no fees to authors—neither page charges (APCs) nor open access fees.

CC-BY-NC means Creative Commons open access license, with full attribution, no commercial use (except excerpts). Excerpts and reuse are allowed with no changes and with a full citation of the original work. An entire article cannot be resold.

Shared copyright means the Society for Scientific Exploration shares copyright with its *JSE* authors.

The *Journal of Scientific Exploration* is indexed in Scopus, Elsevier Abstracts, and the Directory of Open Access Journals (DOAJ).

<https://doi.org/10.31275/20201957> for this whole issue PDF, *JSE* 34:3, Fall 2020.



EDITORIAL

427 **More Terminological Blunders** STEPHEN E. BRAUDE

RESEARCH ARTICLES

434 **Quantifying Biofield Therapy through
Biophoton Emission in a Cellular Model** JEREMY B. KENT
LI JIN
XUDONG JOSHUA LI

455 **Mysticism and the Fine Structure
Constant** PHILIP R. BROWN

493 **Psychedelic Telepathy: An Interview
Study** PETTER GRAHL JOHNSTAD

HISTORICAL PERSPECTIVES

513 **Maxwell Zombies: Mulling and Mauling
the Second Law of Thermodynamics** D. P. SHEEHAN

537 **Dissociation and the Unconscious
Mind: Nineteenth Century Perspectives
on Mediumship** CARLOS S. ALVARADO

OBITUARY

597 **A Parapsychological Naturalist:
A Tribute to Mary Rose Barrington
(January 31, 1926 February 20, 2020)** ZOFIA WEAVER

LETTERS TO THE EDITOR

602 **Quantum Turbulence** KOSTAS DAVANAS

605 **Flying Friars and Other Exceptions** MICHAEL GROSSO

BOOK REVIEWS

- 608 ***Lost Civilizations: The Secret Histories and Suppressed Technologies of the Ancients***
by Jim Willis JOHN B. ALEXANDER
- 614 ***The Paranormal Surrounds Us: Psychic Phenomena in Literature, Culture, and Psychoanalysis*** by Richard Reichbart JAMES CARPENTER
- 620 ***Gerda Walther's Phenomenology of Sociality, Psychology, and Religion***
edited by A. Calcagno RENAUD EVRARD
- 626 ***Charles Richet: A Nobel Prize Winning Scientist's Exploration of Psychic Phenomena*** by Carlos S. Alvarado RENAUD EVRARD
- 629 ***The Source and Significance of Coincidences: A Hard Look at the Astonishing Evidence*** by Sharon Hewitt Rawlette LANCE STORM
- 636 Further Book of Note
The Last Farewell Embrace: Spirituality, Near-Death Experiences, and Other Extraordinary Events among Nurses
by Alejandro Parra JIM B. TUCKER

SSE NEWS

- 638 SSE Annual Meeting Announcement
- 640 Aspiring Explorers News
- 641 Bial Foundation Award
- 642 SSE Masthead
- 643 Index of Previous Articles in JSE
- 664 Gift Orders, Gift Memberships, Back Issues
- 665 Society Membership
- 666 Instructions for JSE Authors

EDITORIAL

More Terminological Blunders

STEPHEN E. BRAUDE

<https://doi.org/10.31275/20201899>

Creative Commons License CC-BY-NC



In my previous Editorial, I took a short detour from the main topic (telepathy and mental privacy) to comment briefly on one of the deeper flaws in the trendy, but seriously misguided, practice of replacing the terms ESP and PK with (respectively) anomalous cognition and anomalous perturbation. As I've discussed in great detail elsewhere (Braude, 2020), there's actually quite a lot that's wrong with this terminological folly. And it's hardly the only time psi researchers have botched efforts to explicate or replace some of the field's key concepts.

The terminological error that I discussed in my earlier Editorial was the failure to accommodate the valuable distinction between ESP-cognition and ESP-interaction. And in that Editorial, I also noted that another, and increasingly trendy, practice likewise commits this error. It's the strategy of abandoning the venerable arsenal of psi-terms and replacing them with a single expression—either nonlocal awareness or nonlocal consciousness. (The underlying rationale for this is usually that the traditional vocabulary is likely to be professionally toxic.) I'm thinking about these matters again because recent events have conspired to remind me of still another, but less trendy and prevalent, approach to parapsychological terminology that also deserves a few words of disapproval.

The approach in question tries to explicate ESP and PK by considering paranormal influence to be a form of *action at a distance*. Now although the serious parapsychological literature hasn't recently devoted much attention to this strategy, I still encounter it in conversations with people who (for the most part) have only a casual acquaintance with the evidence and issues of parapsychology. But this

error hasn't been restricted to parapsychological dilettantes. The most prominent, and perhaps the only fairly recent, parapsychologically well-informed exponent of this strategy has been David Ray Griffin, an admirably serious person, who argued for his revisionary terminology in an interesting paper presenting a Whiteheadian approach to parapsychology (Griffin, 1993), and in an otherwise thoughtful book mostly on the evidence pertaining to survival (Griffin, 1997). I'll assume the later work presents the more refined version of his position and so I'll focus on that. In any case, the notion that psi phenomena are all fundamentally instances of action at a distance is not yet dead (even if it can't be said to be thriving). But perhaps I can finally hasten its thorough demise.

In my comments last issue on the abuse of the term nonlocal, I noted that many apparent examples of both ESP and PK seem clearly to be flagrantly local. If psychic healers can diagnose subtle medical conditions of the client seated before them, that would be an instance of ostensible ESP confined to that small region of space. Similarly, a successful Ganzfeld experiment must be explained in terms of events occurring within the confines of the lab. And we know exactly *where* telepathic influence is occurring when an experimenter's hypnotic command to fall asleep causes the person in a nearby building suddenly to fall asleep, or where causal influence is occurring when a medium levitates a table. Dubbing such interactions nonlocal serves no useful—or for that matter, intelligible—purpose.

Predictably, those who consider psi phenomena to be forms of action at a distance likewise confront problems about event-locality. Let's note first that Griffin states explicitly that what is distinctive of the category of the paranormal is the idea of *influence at a distance to or from minds* (1997, p. 16, italics in original). Thus, PK (or what Griffin termed *expressive psi* in his earlier work) involves the *exertion* of causal influence at a distance by a mind (1997, p. 16, italics in original). And ESP (or what Griffin previously termed *receptive psi*) involves a mind's *reception* of influence from a distance (p. 16). In both cases Griffin distinguishes these forms of paranormal causation from more ordinary causality—e.g., the brain affecting its own body, or ordinary sensory perception, all seemingly easily explicable in terms of spatiotemporally contiguous and transitive causal links.

So the distance mentioned in *action at a distance* may actually be quite small. What matters is that, in paranormal causation, the

proximate cause is not spatiotemporally contiguous with its immediate effect. Still, I would have thought it's clear that this can't be right. Consider first the claim that PK is a form of action at a distance. Unfortunately, that view seems clearly to exclude a very familiar form of ostensible materialization, in which ectoplasm emanates from parts of the medium's body. Assuming the phenomenon is genuine, that alone should be enough to consign the view to the trash heap. But equally seriously, it rules out the possibility of PK on one's own body. For example, if PK is always action at a distance, then what we regard as psychic healing would presumably count as PK when the healer's thoughts produced a change directly in another person's body, but it wouldn't be PK if healers healed themselves by this method. Similarly, we wouldn't be able, in principle, even to *entertain* the hypothesis that the occasionally dramatic physiological effects of self-hypnosis (say, in cases of dissociative identity disorder or multiple personality) are manifestations of PK. But I would have thought it's an interesting, open, and at least partly an *empirical* question whether somatic manifestations of hypnotic suggestion (and kindred phenomena such as placebo effects) should be classified (along with object movements, materializations, etc.) as PK, or whether they result from quite familiar (though as yet undetermined) contiguous physiological processes.

Incidentally, a similar terminological sin concerns a subset of PK phenomena—namely, what some have called *bio-PK*. Evidently, some believe that it's better to eschew the professionally perilous term *PK* and label this subset *DMILS*, which we're told stands for *distant influence on living systems*. But clearly, *DMILS* can't be regarded as synonymous or coextensive with *bio-PK* because that term, in principle at least, allows for the possibility of non-distant influence on one's own body. Some have even suggested that ordinary volition involves the psychokinetic action of one's mind on one's brain, and (as I noted above) others have proposed that (for all we know) PK might be operative in placebo effects, self-healing, and more familiar hypnotic effects on one's own body (e.g., raising welts on one's skin).

Applying the principle of charity, one might think that there's some way of understanding the phrase *action at a distance* so that it covers instances of PK on one's own body. If so, then unless the concept of *distance* has lost all conventional meaning, my guess is that *action at a distance* would have to mean something like *action by means of a noncontiguous connection between cause and effect*. This rendering

of the phrase at least has the virtue of complying with Griffin's desire to repudiate billiard-ball causality (roughly, causality by contact) as the model for causal relations generally. However, in his book Griffin seems to reject this option—or so it appears. In earlier and more impetuous essays, he was clearer on the matter. But in his book, he seems to allow for the possibility of at least some PK on oneself. He assumes that all psychosomatic influences may be mediated through the brain (p. 144) and that the action of the brain on one's body is not paranormal. And presumably, that's because a full account of how the brain affects the body in such cases would reveal a transitive series of spatiotemporally contiguous causal links. Curiously, however, he also claims that stigmata would involve action at a distance if they're cases of direct action of the mind on some portion of the body other than the brain (p. 144).

Frankly, I don't get this. Quite apart from the peculiarity of using the term distance in such a case, I don't see why the direct action of mind on the brain is not PK but direct action of mind on the skin would be. Both cases seem *prima facie* to be examples of mind directly influencing the body. But I'm not concerned here with trying to unravel fine details of Griffin's idiosyncratic view, because there's an overriding flaw in the very idea that PK is always action at a distance. It's a serious error to make a major ontological distinction on the basis of nothing more than a fortuitous spatial arrangement of physical objects. It's analogous to saying that I can hit (or criticize) another person, or make another person unhappy, but I can't hit (criticize) myself, or make myself unhappy, because those forms of causation can only occur over a distance. The proper response to such a claim (after the obligatory guffaw) would be that the processes are the same whether I or another object are affected, and that we shouldn't make such a big deal out of nothing more than a contingent difference in the *location* of the affected object. Similarly, one can stab, observe, poison, anger, compliment, and listen to both oneself and others—and of course, pat oneself on the back. And indeed, many causal (and epistemological) relations can be reflexive.

Similar problems afflict the attempt to treat ESP as a form of action at a distance. Griffin claims that the term receptive psi covers everything that is usually covered under 'extrasensory perception'. But in fact, that approach excludes the possibility of using ESP on one's own body. Presumably, it would be a case of receptive psi when healers

clairvoyantly diagnose an illness in another person (e.g., to determine the precise location of a blood clot or tumor), but not when healers clairvoyantly elicit the same information concerning themselves. And that does seem as arbitrary and antecedently incredible as maintaining that one can smell another person but not smell oneself, or that one can hear the growling stomach of another person but not one's own.

Interestingly, the escape route that might have worked in the case of PK doesn't work here. It won't help to reconstrue action at a distance so that receptive psi means something like the experiencing or registering of causal influences by means of a noncontiguous connection between cause and effect. That move would have consequences nearly as awkward as those they're intended to avoid. Most notably, memory would count as a form of ESP, since (contrary to the popular wisdom) so-called mnemonic causation is not explicable in terms of spatiotemporally contiguous causal chains—in particular, with reference to memory traces, which in theory are supposed to bridge the spatiotemporal gap between the present memory event and the temporally remote thing remembered. But as I and others have argued, that view is simply, and quite literally, a form of disguised deep nonsense (Braude, 2002, 2014; Bursen, 1978; Heil, 1978).

Moreover, there's another respect in which the terms expressive psi and receptive psi fail as synonyms for PK and ESP (respectively), or simply as conceptually illuminating replacements for those terms. Telepathic *influence*, of one mind directly on another, is not receptive psi to a telepathic agent. It's receptive psi only to a telepathic percipient (or victim). From the point of view of the agent initiating that influence, it could legitimately be called expressive psi—and thus count for Griffin as an instance of PK, even though the causality may not produce a physical effect. But the traditional, venerable, and as far as I can determine still reasonable, view is that telepathy is a form of direct mind-to-mind interaction, *irrespective of whether we're considering the point of view of agent or percipient*. Granted, it may be difficult (if not impossible) to know whether a particular case is one of telepathic influence on the percipient's mind or PK on the percipient's brain. But no such ambiguity afflicts the *concepts* of telepathy and PK. It's telepathy so long as the interaction is between minds, and it's PK if the causality is the mind acting directly on a physical object (including the brain). Those two forms of paranormal interaction may be operationally indistinguishable (at least at our present level of technological

sophistication), but they're easy to distinguish conceptually. So Griffin's view awkwardly and implausibly dissolves (or at least clouds) the otherwise reasonable and easily intelligible distinction between telepathic influence and PK.

Incidentally, in actual cases of ostensible telepathy it's likewise a challenge to determine the *direction* of the telepathic causal arrow—that is, whether *A*'s mind is imposing its influence on that of *B*, or whether *B* is somehow aware of (or reading) the contents of *A*'s mind (as it were, invading *A*'s supposedly private mental space). But the term receptive psi seems to cover only the latter option. The former option—*A* paranormally *influencing* the thoughts of *B*—would (as before) seem to be an instance of expressive psi and thereby count as a form of PK, even if the interaction is directly mind-to-mind. But there was never anything wrong with the old tradition of considering either causal scenario to be telepathic as long as the causality is strictly between minds or mental states. Nothing here needed fixing! So once again, it's clear that receptive psi and expressive psi fail either as synonyms or illuminating replacements for (respectively) ESP and PK.

I don't know why parapsychological dilettantes hold the view that psi phenomena are all forms of action at a distance. But Griffin, apparently, is led to this unfortunate position because of the great importance he attaches, right from the start, to the significance of action at a distance for the scientific view of the world. It was simply a mistake to place so much importance on the concept of *distance*. Griffin is justified in noting that science has occasionally relied on mistaken assumptions about the nature of causal relations. And he and many other philosophers have correctly noted that there's nothing inherently wrong with gappy causation. But the traditional (and by no means universal) insistence on billiard-ball causality, or spatiotemporal contiguity of cause and effect, is merely a symptom of a deeper error—namely, a misguided *mechanistic* approach to observable phenomena generally, and an associated reliance on what I've called the *small is beautiful assumption*. However, that's a huge topic, far exceeding the appropriate limits for an Editorial. It's also a topic I've covered at length elsewhere (Braude, 1997, 2014).

However, there's still more to say about definitions in parapsychology, and (barring some unforeseen distraction) I'll continue with that topic in my next Editorial.

REFERENCES

- Braude, S. E. (1997). *The limits of influence: Psychokinesis and the philosophy of science* (Rev. ed.). University Press of America.
- Braude, S. E. (2002). *ESP and psychokinesis: A philosophical examination* (Rev. Ed.). Brown Walker.
- Braude, S. E. (2014). *Crimes of reason: On mind, nature, & the paranormal*. Rowman & Littlefield.
- Braude, S. E. (2020). *Dangerous pursuits: Mediumship, mind, and music*. Anomalist Books.
- Bursen, H. A. (1978). *Dismantling the machine theories of memory*. D. Reidel.
- Griffin, D. R. (1993, July). Parapsychology and philosophy: A Whiteheadian postmodern perspective. *Journal of the American Society for Psychical Research*, 87(3), 217–288. <http://www.anthoniflood.com/griffinparapsychology.htm>
- Griffin, D. R. (1997). *Parapsychology, philosophy, and spirituality: A postmodern exploration*. State University of New York Press.
- Heil, J. (1978, March). Traces of things past. *Philosophy of Science*, 45, 607–2. <https://doi.org/10.1086/288779>

RESEARCH ARTICLE

Quantifying Biofield Therapy through Biophoton Emission in a Cellular Model

JEREMY B. KENT

Department of Family Medicine, University of Virginia Athletics,
University of Virginia Health System, Charlottesville, Virginia USA
Jbk7y@Virginia.edu

LI JIN

Department of Orthopaedic Surgery, University of Virginia

XUDONG JOSHUA LI

Department of Orthopaedic Surgery, University of Virginia Health System

Submitted October 11, 2019; Accepted March 5, 2020; Published September 15, 2020

<https://doi.org/10.31275/20201691>

Creative Commons License CC-BY-NC

Abstract Biofield therapy has shown positive results over a broad range of pathology from preclinical research to human studies. However, biofield therapy investigation is limited by an inability to quantify the therapeutic effect. This study aimed to measure the effects Reiki had on mice intervertebral disc (IVD) cells compared with sham and to quantify Reiki by measuring photon emission. We treated mice IVD cells with ten-minute sessions of either Reiki or sham on three successive days. During treatment, we placed the cells in a specifically constructed box with an installed photomultiplier tube (PMT). Reiki significantly increased the photon emission of the cells post-treatment compared with Reiki pre-treatment and sham ($p < 0.05$). Real time PCR (RT PCR) showed an increase in collagen II and aggrecan ($p < 0.05$). We present a means to quantify biofield therapy by measuring the post-treatment photon emission. We concurrently demonstrate Reiki's effect on the anabolic healing response.

INTRODUCTION

Biofield research is an emerging area of study (Muehsam et al., 2015; Rubik et al., 2015). The biofield is a complex organization of subtle energetic forces that maintains and regulates the delicate balance

of an organism (Rubik et al., 2015). The current agreed-upon theory of the biofield is that it interacts directly with the organism and external environment and may be as much a conduit for information transmission as it is for energy transfer (Rubik et al., 2015). Biofield therapy seemingly works within this framework to manipulate the biofield to positively affect illness (Rubik, 2002).

Biofield therapy has shown positive results over a range of ailments, including the reduction of pain and stress (Anderson & Taylor, 2012; Hammerschlag et al., 2014; Jain & Mills, 2010). Preclinical research in Therapeutic Touch decreased the immune response in mice injected with breast cancer cells and increased osteoblast DNA synthesis and mineralization of human osteoblasts (Gronowicz et al., 2015; Jhaveri et al., 2008).

The mechanism through which biofield therapy acts is unknown. Research has investigated different modalities to describe biofield therapy such as the electromagnetic field properties of electricity and magnetism, sound, and pH (Joines et al., 2012; Kokubo et al., 2007; Kokubo & Yamamoto, 2007; Matos et al., 2017; Muehsam et al., 2015; Rubik & Jabs, 2017). While these different options hold promise, the impasse that continues to deadlock biofield therapy research is the combination of an unclear mechanism and the inability to quantify the dose or the therapeutic effect.

Previous research has based the therapeutic dose on session time (Gronowicz et al., 2015, 2016; Jhaveri et al., 2008). However, session time is likely an inaccurate means to measure the strength of biofield therapy. Biofield practitioners have different training levels and experience. Some people may be more adept than others in promoting healing. As a result, questions remain about the reliability of time as a factor in testing. Consequently, if a study is unable to demonstrate the reliability of the practitioner, the fidelity of the results comes into question.

A solution may lie in the potential link between biofield therapy and the light emitted from living organisms, called biophoton emission (BE) (Ives et al., 2014). BE, also named ultra-weak photon emission, autoluminescence, and spontaneous chemiluminescence, is the discharge of very small amounts of light measured in photons and seen in all living organisms (Cifra & Posp šil, 2014; Popp et al., 1984). BE has been postulated as a mechanism to further investigate biofield

therapy (Ives et al., 2014; Kafatos et al., 2015; Muehsam et al., 2015; R. Van Wijk et al., 2014).

BE research began in the early twentieth century with the discovery that certain cells communicated by emitting small amounts of light in the ultraviolet (UV) to visible spectrum (Cifra et al., 2011; Cifra & Posp šil, 2014). One hundred years later the details of this communication are still unclear as it is uncertain how cells spontaneously produce light and through which receptors the light is translated to stimulate change. There are a number of different theories on how this occurs, including production of photons within DNA, within mitochondria, at the cell membrane, or through the cell cytoskeleton (Cifra et al., 2011; Dotta et al., 2011; Jibu et al., 1994; Kumar et al., 2016; Prasad et al., 2014).

BE research now encompasses several different subdisciplines to include cell-to-cell communication, organism pathology, organism health, and biofield research (Cifra et al., 2011; Cifra & Posp šil, 2014; Ives et al., 2014; Kafatos et al., 2015; Kucera & Cifra, 2013). BE is defined as photon radiation generated from the cell's endogenous energy storage. BE research can be further divided into BE that is spontaneously generated and BE that is induced. Induced BE is typically caused by stress on the organism or cell by factors such as infection, mechanical stress, and ionizing radiation (Cifra & Posp šil, 2014).

Elevated oxidation and free radical production are well-documented processes associated with disease states (R. Van Wijk et al., 2014). When researchers established links among oxidation, free radical production, and an increase in BE, this led to further investigation of using BE as a means to measure an individual's health (E. P. Wijk & Wijk, 2005; R. Van Wijk, 2001). Recent studies have shown an association of increased BE in multiple sclerosis patients (Hammann et al., 1987), ankylosing spondylitis (K. J. Ho et al., 2000), and in chronic lung disease (Koval'chuk et al., 1998). This increase in BE during stress, illness, and disease (Grasso et al., 1992; Keshavarzian et al., 1992; E. P. Van Wijk et al., 2010) corresponds to a number of studies that show that BE decreases in healthful behavior such as meditation (E. P. Van Wijk et al., 2006; E. P. Van Wijk et al. 2008a; E. P. Van Wijk et al., 2008b).

In apparent contrast, a few studies have demonstrated an increase in BE after performing biofield therapy (Joines et al., 2012; Kokubo et al., 2007; Rubik & Jabs, 2017). Joines et al. studied BE in more than

100 persons with the intent to perform biofield therapy. They noted a significant increase in the quantity of photons measured in the ultraviolet spectrum when comparing the BE of a biofield practitioner during biofield therapy with the BE of a non-biofield practitioner (Joines et al., 2012). Rubik et al. (2006) noted a significant increase in BE pre-treatment compared with post-treatment, measured from the practitioner's palms. They also noted a trend that a biofield practitioner's intention to increase BE did just that (Rubik & Jabs, 2017).

It is unclear why a discrepancy exists between BE studies on meditation and biofield therapy. Presumably, meditation and biofield therapy would have similar BE results. The disparity may arise from the difference in the intent of the participants. Biofield practitioners set their intent to manipulate someone or something else, while persons in meditation set their focus inward on self-reflection.

Other research has investigated biofield therapy's effect on the subjects that it is directed toward. Kokubo et al. measured the BE of cut cucumbers after layi ng-on-hands and found an increase in BE compared with controls measured post-treatment (Kokubo et al., 2007; Kokubo & Yamamoto, 2007).

An important distinction in BE research is that of delayed luminescence. While BE is the production of photons from the cell's own energy supply, delayed luminescence is the emission of photons induced by an external light source. A light source stimulates the cell to emit photons through the principles of quantum optics and the photoelectric effect as well as through the photochemical cascade at the cellular level (H fner, 1996; Lakowicz, 2006; Martin & Wiese, 2006). Delayed luminescence has typically described a process in plants with an established photosystem, but research has shown that other organisms also produce delayed luminescence (Scordino et al., 2014).

The differentiation between BE and delayed luminescence is significant when investigating biofield therapy, since each entails different mechanisms of action. If the mode of biofield therapy is BE, as evidenced in previous studies (Joines et al., 2012; Rubik & Jabs, 2017), then biofield therapy would be a light source. Biofield therapy as a light source would stimulate photon emission through delayed luminescence. As an example, the study results reported by Kokubo et

al. (2007) would be a form of delayed luminescence.

Conversely, if the mechanism through which biofield therapy produces effect is not light, then the photons emitted from the subject is BE. The subject is stimulated to generate photons without a light source and instead through an endogenous energy pathway. Differentiating the effects biofield therapy triggers in a subject, whether it is BE or delayed luminescence, is evidence for biofield therapy's mechanism. In this paper, we use three terms to describe the emission of photons, including biophoton emission and delayed luminescence as described above, and photon emission. We use the term photon emission to describe the radiation of photons without discriminating between the mechanism. We use photon emission primarily when it is unclear which mechanism is being demonstrated, BE or delayed luminescence.

The biofield therapy this study utilized was Reiki. Reiki purportedly channels the universal life energy to enhance healing. Reiki uses the practitioner's hands as an important connection with the subject. Reiki students learn through in-person seminars and workshops, graduating from first degree to second degree to the master level over the course of years of practice (Rand, 2000; Stein, 1995). Reiki is an apt technique for the study's design that includes the practitioner placing their hands in a box. Reiki has been studied extensively for treating pain, anxiety, depression, and in vitro bacterial cultures (Joyce & Herbison, 2015; Rubik et al., 2006; Thrane & Cohen, 2014). In this paper, we use the term Reiki to refer to the practice itself and not to the reiki energy or life force that Reiki channels. We use the term biofield therapy as a broader description of a number of similar techniques including Reiki, which other published articles have described in equivalent terms (Rubik et al., 2015).

To test the effects of Reiki, we used mouse intervertebral disc cells (IVD). IVDs consist of a fibrocartilage structure made of collagen. Degeneration and damage to the fibrocartilage leads to low back pain (Huang et al., 2018). Discogenic pain is associated with low back pain. IVD cells are well-established in the study of low back pathology (Liu et al., 2013). Research has demonstrated that collagen tissue displays delayed luminescence when stimulated with a light source (M. W. Ho et al., 2002). As such, collagen is an adequate cellular model to investigate BE.

Treatment for degenerative IVD is limited (Casazza, 2012). Recovery

can be prolonged and chronic pain is not uncommon. Biofield therapy has the potential to improve pain and augment the healing process.

In this paper, we report on investigations of biofield therapy through measuring photon emission. We conducted our research using a custom light-tight box with an installed photomultiplier tube (PMT) described below. We made two assumptions based on previous data as detailed above:

- 1) Biofield therapy practitioners with the intent to perform biofield therapy increase BE from their hands.
- 2) Stressed IVD cells stimulate an increase in BE.

We hypothesized that Reiki directed at IVD cells stimulates an increase in photon emission post-treatment. We concurrently examined the effectiveness of Reiki by measuring anabolic extracellular matrix synthesis markers of IVD cells.

METHODS

Light Box Construction

We constructed two boxes out of plywood to create a very-low-light environment, which ensured accurate measurement of the small amount of light released in BE. The box's dimensions were 710 × 510 × 510 mm and 790 × 560 × 580 mm. We coated the box edges with black sealant. The smaller box fit into the larger box. A nonreflective black polyester fabric covered the interior of the smaller box. Reflectix reflective roll insulation (Reflectix, Markleville, IN) was wrapped around the outer box. We cut two 130-mm-diameter holes on one side of each box for hand placement. We stitched two sleeves, each three feet long and made of a cotton and spandex blend (90%, 9%, respectively). We covered each sleeve in Reflectix and attached one sleeve to each cutout. On the lid of the inner box was mounted a polystyrene foam box with a PMT, described below, installed inside. On the floor of the box, we placed an elevated wooden tray that covered the width of the box. We made a 153-mm-diameter circular cutout in the middle of the tray. We threaded a nylon wire mesh over the tray cutout to act as a platform to hold the cell plates. An aluminum conical connected the tray to the PMT.

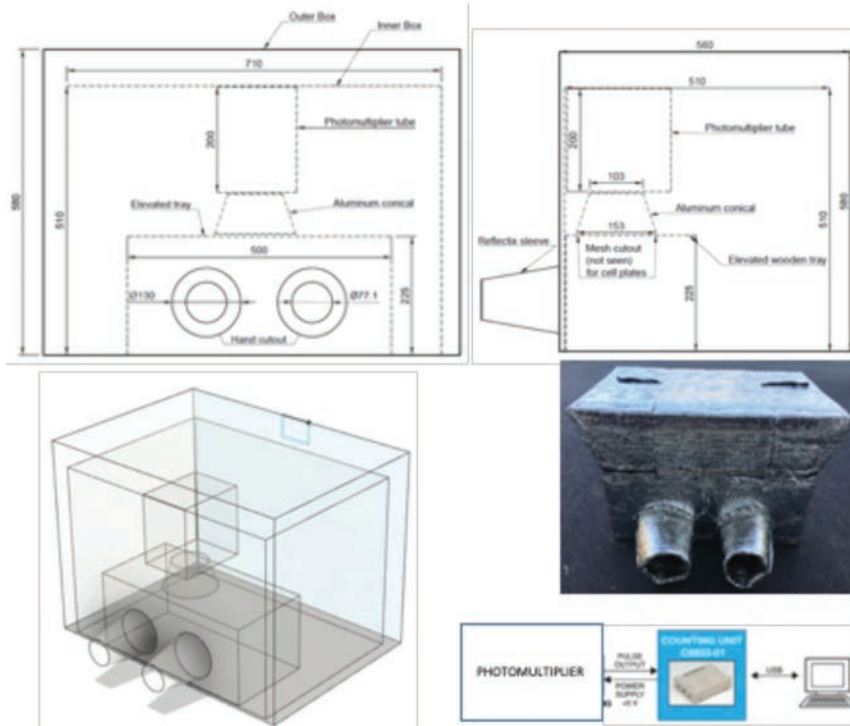


Figure 1. Design of the light box that was tailored to measure biofield therapy from the hands of practitioners. The practitioner placed their hands through the cutouts, within the elevated wooden tray and underneath the cell plate tray. The cells lay on the cell plate tray. The PMT box houses the PMT (not shown); the cables thread through the upper window flaps. The schematic details the connection of the PMT via the counting unit to the laptop PC. All measurements are in millimeters.

The conical encased the cell plates lying on the mesh and aligned them directly under the PMT separated by a distance of 76 mm. Figure 1 is a photograph and a schematic of the light box. The practitioner placed their hands through the sleeve and the two box cutouts, positioning their hands under the nylon mesh of the tray, palms up, facing the cells. We conducted baseline readings of the light box in a room with a low level of light. The baseline readings were 6.8 ± 3.0 photons per second (CPS). The readings were equal to the manufacturer's advertised dark count for the PMT used in this study.

Biophoton Emission Measurement

We used a PMT (Hamamatsu model H6240-1 side-on photomultiplier module, Hamamatsu Photonics, Japan) with an effective spectral response range of 185–850 nm. The photocathode window measured 8 mm by 24 mm. We attached to the PMT an infrared cutoff filter, Schott KG-1 heat-absorbing glass 25 mm × 25 mm (Schott, Mainz, Germany) with a transmission of 2757–50 nm. The Schott infrared filter was used to block infrared photons. The filter eliminated photon emission as a result of heat. Connected to the PMT was a Hamamatsu C8855-01 photon counter (Hamamatsu Photonics). The photon counter connected to a PC laptop via USB. We used Hamamatsu Control Software for the C8855-01 photon counter (Version 2.00), counting one photon per second. The PMT was cooled to 5 °C and housed in a polystyrene foam box. Ambient temperature of the room where we conducted the study averaged 23.3 °C on day 1, 22.2 °C on day 2, and 22 °C on day 3.

IVD Cell Isolation

All procedures involving animal materials were approved by the Institutional Animal Care and Use Committee of the authors' institution. Mice were sacrificed and the lumbar discs were dissected and cultured in a 60-mm dish at 80–90% confluence and in a 37 °C warming incubator, as reported previously (Liu et al., 2013). To simulate pathology and induce cell stress, we supplemented the cell medium with a pro-inflammatory cytokine, tumor necrosis factor- α (TNF- α , 10 ng/mL) 48 hours prior to the first Reiki or sham treatment. Research has shown that TNF- α not only stresses cells, but also stimulates BE from the cells in medium (Madl et al., 2017; R. van Wijk et al., 2010).

Reiki

One Reiki practitioner participated in this study. This person is a master level practitioner who has more than thirty years of active experience in providing and teaching Reiki. The Reiki practitioner performed Reiki according to standard technique (Rand, 2000; Stein, 1995). One sham practitioner also participated in this study. The sham practitioner had no knowledge of biofield therapy and was asked to think of distracting thoughts such as counting backwards.

<u>Biophoton Emission Protocol</u>			
Purge system	no cells	3 minutes	
Measurement 1	Pre-treatment	cells, no practitioner	3 minutes
Measurement 2	Treatment	cells, practitioner	10 minutes
Measurement 3	Post-treatment	cells, no practitioner	10 minutes
Purge System 4	no cells, no practitioner	3 minutes	
Measurement 5	no cells, no practitioner	3 minutes	

Figure 2. Biophoton emission measuring protocol. Protocol was completed each day for 3 days. Sham was conducted before Reiki.

We conducted the photon emission measurements over a three-day period. At the beginning of each day, we purged the box of light by recording PMT measurements for eight minutes. The protocol to measure the BE is found in Figure 2. Both the Reiki and sham practitioners were exposed to no sunlight at least 20 minutes prior to starting the study to limit them incidentally absorbing light into the skin (E. P. Wijk & Wijk, 2005). We conducted each group in sequence, sham first then Reiki, with minimal delay between groups to switch the practitioner and cells. We designated two cell plates for sham treatment and two cell plates for Reiki treatment. We placed both cell plates in the box on the tray concurrently during treatment. After treatment, a warmer housed the cell plates to be utilized for each treatment day. Treatment lasted 10 minutes. This was duplicated for Reiki and sham treatments for a total of three days. We chose three days based on a previous successful protocol we developed utilizing the same cell and molecular biology techniques (Liu et al., 2013). The study was conducted in February 2017 in a nondescript lab room with no windows in a large research facility.

We measured the internal validity of the light box by comparing the BE of stressed IVD cells to unstressed cells over a three-day period (Figure 3). Day 1 of the internal validity test was not significant. We theorize that the first day was inconsistent with expected results due

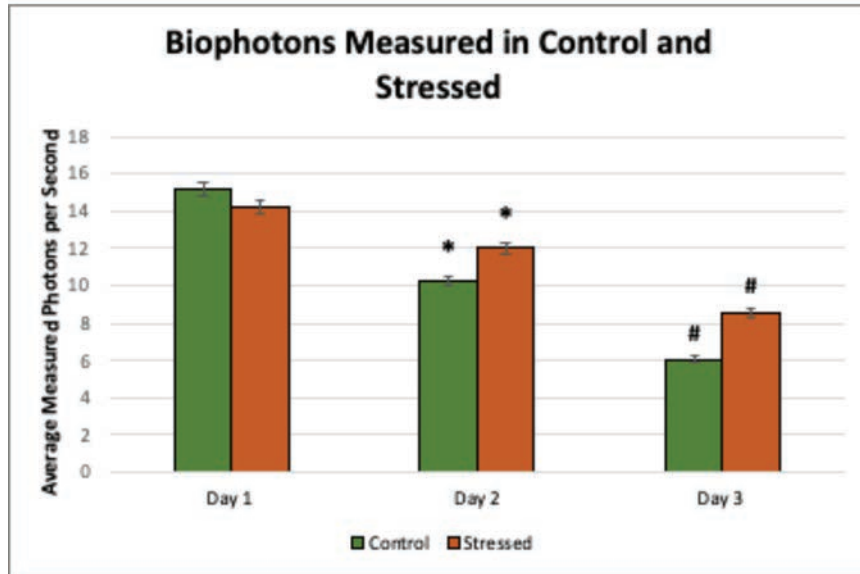


Figure 3. We measured the internal validity of the light box by comparing the BE of stressed intervertebral disc cells with TNF α to unstressed cells over a threeday period. The results on Days 2 and 3 were as expected. Day 1 was not as expected, but we attribute this to a short time period to allow the stress to produce BE (* $p < 0.05$, # $p < 0.05$).

to the short time to induce stress. Days 2 and 3 showed a significant increase in BE from the TNF- α supplemented cells compared with the control cells, as expected (Figure 3).

PCR Assay

Twenty-four hours after the last Reiki treatment, we extracted total RNA from the disc cells using the Reagent QIAGEN (Thermo Fisher Scientific, Waltham, MA). We determined the RNA concentration using a Nanodrop spectrophotometer at 260 nm. Complementary DNA was synthesized using the iScript cDNA Synthesis Kit (Bio-Rad, Hercules, CA). Quantitative PCR containing SYBR green master mix Real-time PCR was performed with iQ 5 multicolor real-time PCR Detection System (Bio-Rad, Hercules, CA). The mRNA expression of anabolic genes collagen I, collagen II, and aggrecan was evaluated. We used 18S rRNA as an internal control.

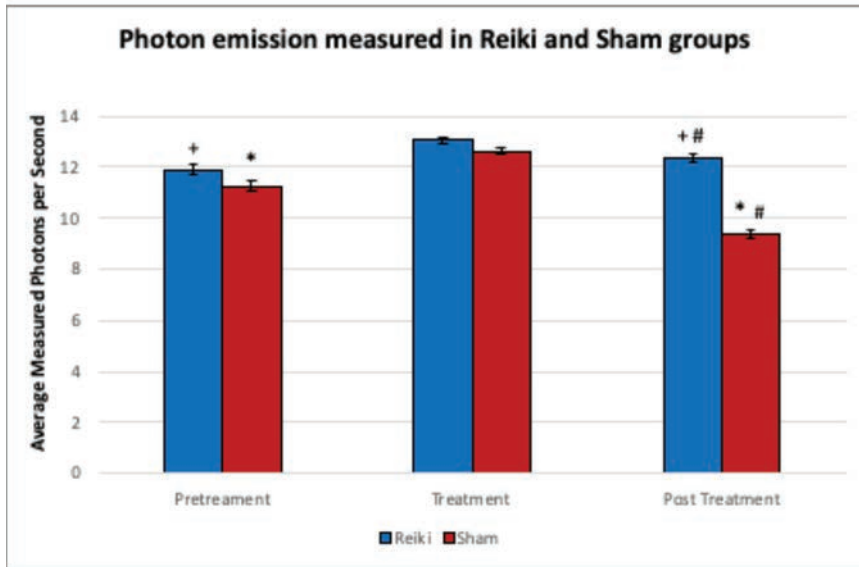


Figure 4. The average number of biophotons emitted per second for Reiki and sham groups over the three treatment days. Post-treatment photon emission was significantly different from both Reiki pre-treatment and Reiki post-treatment. Photon emission was significantly different between Reiki post-treatment and sham post-treatment (+ $p < 0.05$, # $p < 0.05$, * $P < 0.05$).

Statistics

We performed all experiments with duplicate cell plates. Statistical analysis for quantitative assays was performed by 1-way analysis of variance assuming equal variance using Microsoft Excel software version 14 (Microsoft, Redmond, WA, USA). A p value of less than 0.05 was considered statistically significant.

RESULTS

Biophoton Emission

The study found a statistically significant difference between photon emission measured in Reiki post-treatment compared with the Reiki pre-treatment (+ $p < 0.05$) (Figure 4). When comparing Reiki and sham groups during the post-treatment period, Reiki showed a significant increase in photon emission compared with sham (# $p < 0.05$) (Figure

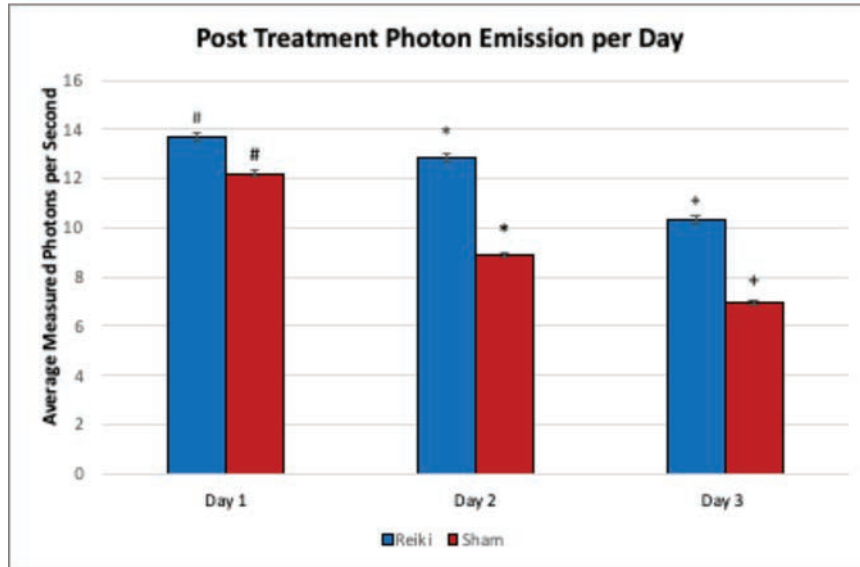


Figure 5. Comparison of photon emission for posttreatment groups of Reiki and sham on days 1, 2, and 3. Reiki increased photon emission compared with sham on each day measured (# $p < 0.05$, * $p < 0.05$, + $p < 0.05$).

4). On a day-by-day comparison, post-treatment Reiki maintained a higher BE than the post-treatment sham group ($p < 0.01$) (Figure 5). We found no difference in BE between Reiki and sham during treatment (Figure 4).

RT PCR

Healthy disc cells maintain a balance between anabolism and catabolism. During aging and degeneration, the imbalance may reduce cell viability and extracellular matrix synthesis. Collagen II (COL2), collagen I (COL1), and aggrecan are typical anabolic matrix proteins. Reiki and sham treatments were compared after TNF- α administration. Reiki significantly increased COL2 compared with sham ($p < 0.05$). It also significantly increased aggrecan over sham ($p < 0.05$). Reiki increased COL1 over sham, but this was not significant (Figure 6).

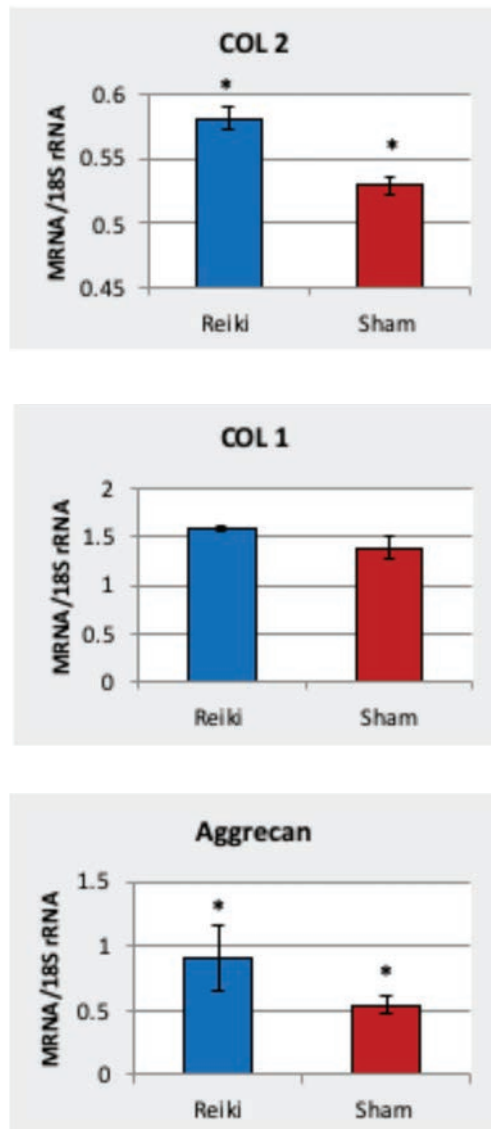


Figure 6. Reiki enhanced intervertebral extracellular matrix gene expression. At day 3, total RNA was extracted and gene expression of COL₁, COL₂, and aggrecan was evaluated by real-time PCR ($*p < 0.05$). Reiki showed a significant difference in COL₂ and aggrecan from sham. Although increased from sham, gene expression for COL₁ was not significant.

DISCUSSION

Although the evidence for the positive effects of biofield therapy continues to mount, biofield therapy research remains hampered by our inability to quantify the therapeutic effect. This study investigated BE and delayed luminescence to quantify biofield therapy.

The results showed that post-treatment photon emission from Reiki-treated cells was higher than pre-treatment BE (Figure 3). These results are consistent with Kokubo et al. (2007) who showed an increase in photon emission after laying on of hands. Post-treatment photon emission is a measure of the subject's response to Reiki. Response is a means to indirectly quantify a treatment. To directly quantify a treatment, the treatment composition must be known, in order to calculate a dose response relationship. Since Reiki's mechanism and structure have not yet been clearly identified, we must rely on indirect methods to quantify it. Our data support the conclusion that the difference between post-treatment photon emission and pre-treatment BE is a measure of biofield therapy.

This study was novel in two major respects. It combined several different subcategories of photon emission including spontaneous BE, stress-induced BE from TNF- α , and delayed luminescence. The study design also measured photon emission at multiple time points while concurrently measuring the cellular response to biofield therapy after induced pathology by TNF- α . However, the complexity of the study also produced some limitations. Primarily, our study results did not support our initial assumptions of BE, leaving unanswered questions. We presupposed, based on previous research, that the Reiki mechanism is BE (Joines et al., 2012; Kokubo et al., 2007; Kokubo & Yamamoto, 2007; Rubik & Jabs, 2017). Because of this, we expected Reiki BE to increase compared with sham BE during treatment if all other factors were equal including the TNF- α induced stress on the cells. However, Reiki and sham BE were not significantly different in the treatment group. An explanation for the Reiki treatment group measurements being lower than expected is that the Reiki-induced cells absorbed the emitted photons from the practitioner, which prevented the PMT from measuring the photons. Instead, the photons were measured post-treatment according to delayed luminescence. As a result of a

lower- than-expected Reiki measurement during treatment, we cannot confirm that BE in the 2757–50 nm wavelength range is the mechanism for biofield therapy. Consequently, we cannot determine which form of photon emission occurred, post-treatment BE or post-treatment delayed luminescence. In fact, both forms of photon emission may be occurring concurrently (Cifra & Pospíšil, 2014). We also cannot make conclusions with respect to the discrepancies that exist among studies measuring the BE of diseased subjects, meditation, and biofield practitioners. Two different processes may be occurring. The intent of the subject tested is likely a factor in this relationship, which could be a basis for a different mechanism of action. The state of the subject might also be a factor. A subject that is in a state of equilibrium may not emit as much BE as a subject that is in disequilibrium. If so, then comparing the BE of diseased subjects, meditation, and biofield practitioners as similar mechanisms may be incorrect.

We assumed that BE would increase during biofield therapy treatment and this increased quantity of BE would indicate a greater therapeutic effect. However, the sheer quantity of BE may not be the driving force that enhances the therapeutic effect. The mechanism of action might be through another form of information transfer not related to the bulk photon energy transmission of delayed luminescence. This would correspond with the original discovery of BE as a means of cell-to-cell communication. Other authors have described this as a coherent state of the biophoton field (Popp et al., 1984; Popp et al., 2002). In which case, categorizing all forms of BE as communication may be a more apt description of the process instead of subdividing BE. All BE may be a form of communication to the external environment. Consequently, the absolute quantity of BE is not as important as understanding the patterns within BE. Similar ideas were put forth by Rubik et al. (2015) when they described the biofield in terms of biofield communication and biofield regulation. This line of thought would also coincide with the state of equilibrium of the subject. An organism in a balanced state would not need to communicate with the environment as much as one that is stressed or intending to communicate.

Other factors may play a part in the mechanism of BE and biofield therapy, including a wavelength spectrum not measured in this study, photon spin, and momentum. Alternatively, post-treatment photon

emission may be the byproduct of biofield therapy and the mechanism through which it occurred might be an entirely different form of energy.

Our second assumption that sham BE should be consistent did not bear out in our study. We found that sham-treated cells saw a decrease from pre-treatment BE to post-treatment BE. TNF- α should have induced consistent BE from the stress it produced on the cells. A possible explanation for this difference may be that the cells were overstressed, leading to a decline in their overall function with each successive day. This could explain the stepwise decrease in post-treatment photon emission.

We utilized only one Reiki practitioner. Other practitioners or forms of biofield therapy may produce different BE results. Different treatment durations might cause different results, and the subject's maximum healing potential may peak after a certain length of treatment period.

The cellular results are consistent with previous preclinical research and show that Reiki enhances the healing cascade in cells. Reiki significantly increased COL2 and aggrecan. COL2 and aggrecan are extracellular matrix proteins critical in the structure and function of cartilage. In damaged or diseased cartilage, COL2 and aggrecan decrease. Reiki attenuated their decrease in cells treated with TNF- α . Extracellular matrix proteins also have been proposed as potential generators of BE. Their stimulation in this study may be further evidence of a link between the cell cytoskeleton and BE from endogenous pathways (Cifra et al., 2011; Jibu et al., 1994; Prasad et al., 2014). Future research in biofield therapy would investigate varying treatment durations, different practitioners, and diverse cellular markers in the signaling cascade and healing cascade.

REFERENCES

- Anderson, J. G., & Taylor, A. G. (2012). Biofield therapies and cancer pain. *Clinical Journal of Oncology Nursing*, 16(1), 43–48. <https://doi.org/10.1188/12.CJON.43-48>
- Casazza, B. A. (2012, February). Diagnosis and treatment of acute low back pain. *American Family Physician*, 85(4), 343–350.
- Cifra, M., & Pospšil, P. (2014, October 5). Ultra-weak photon emission from biological samples: Definition, mechanisms, properties, detection and applications. *Journal of Photochemistry and Photobiology B: Biology*, 139, 2–10. <https://doi.org/10.1016/j.jphotobiol.2014.02.009>

- Cifra, M., Fields, J. Z., & Farhadi, A. (2011, May). Electromagnetic cellular interactions. *Progress in Biophysics and Molecular Biology*, 105(3), 223–246. <https://doi.org/10.1016/j.pbiomolbio.2010.07.003>
- Dotta, B. T., Buckner, C. A., Cameron, D., Lafrenie, R. M., & Persinger, M. A. (2011, September). Biophoton emissions from cell cultures: Biochemical evidence for the plasma membrane as the primary source. *General Physiology and Biophysics*, 30(3), 301–309.
- Grasso, F., Grillo, C., Musumeci, F., Triglia, A., Rodolico, G., Cammisuli, F., Rinzivillo, C., Fragati, G., Santuccio, A., & Rodolico, M. (1992, January). Photon emission from normal and tumor human tissues. *Experientia*, 48, 10–13. <https://doi.org/10.1007/BF01923595>
- Gronowicz, G., Secor, E. R., Jr., Flynn, J. R., Jellison, E. R., & Kuhn, L. T. (2015). Therapeutic touch has significant effects on mouse breast cancer metastasis and immune responses but not primary tumor size. *Evidence-Based Complementary and Alternative Medicine*, 926565. <https://doi.org/10.1155/2015/926565>
- Gronowicz, G., Secor, E. R., Jr., Flynn, J. R., & Kuhn, L. T. (2016, September). Human biofield therapy does not affect tumor size but modulates immune responses in a mouse model for breast cancer. *Journal of Integrative Medicine*, 14(5), 389–399. [https://doi.org/10.1016/S2095-4964\(16\)60275-3](https://doi.org/10.1016/S2095-4964(16)60275-3)
- Hammann, K. P., Roder, R., & Hopf, H. C. (1987). The behaviour of OKT3-, OKT4- and OKT8-positive cells during phases of elevated spontaneous chemiluminescence activity (CL-A) in multiple sclerosis patients. A serial study. *Journal of Neurology*, 234(1), 25–30. <https://doi.org/10.1007/BF00314005>
- Hammerschlag, R., Marx, B. L., & Aickin, M. (2014, December 16). Nontouch biofield therapy: A systematic review of human randomized controlled trials reporting use of only nonphysical contact treatment. *Journal of Alternative and Complementary Medicine*, 20(12), 881–892. <https://doi.org/10.1089/acm.2014.0017>
- Ho, K.-J., Chen, P.-Q., Chang, C.-Y., & Lu, F.-J. (2000). The oxidative metabolism of circulating phagocytes in ankylosing spondylitis: Determination by whole blood chemiluminescence. *Annals of the Rheumatic Diseases*, 59(5), 338–341. <https://doi.org/10.1136/ard.59.5.338>
- Ho, M. W., Musumeci, F., Scordino, A., Triglia, A., & Privitera, G. (2002, April). Delayed luminescence from bovine Achilles' tendon and its dependence on collagen structure. *Journal of Photochemistry and Photobiology B: Biology*, 66(3), 165–170. [https://doi.org/10.1016/S1011-1344\(02\)00239-7](https://doi.org/10.1016/S1011-1344(02)00239-7)
- Huang, Y.-C., Hu, Y., Li, Z., & Luk, K. D. K. (2018, November). Biomaterials for intervertebral disc regeneration: Current status and looming challenges. *Journal of Tissue Engineering and Regenerative Medicine*, 12(11), 21–22.

- <https://doi.org/10.1002/term.2750>
- H fner, S. (1996). Introduction and basic principles. *Photoelectron Spectroscopy: Principles and Applications* (pp. 95 1). Springer.
- Ives, J. A., van Wijk, E. P. A., Bat, N., Crawford, C., Walter, A., Jonas, W. B., van Wijk, R., & van der Greef, J. (2014, February 28). Ultraweak photon emission as a non-invasive health assessment: A systematic review. *PLoS One*, 9(2), e87401. <https://doi.org/10.1371/journal.pone.0087401>
- Jain, S., & Mills, P. J. (2010). Biofield therapies: Helpful or full of hype? A best evidence synthesis. *International Journal of Behavioral Medicine*, 17(1), 1 16. <https://doi.org/10.1007/s12529-009-9062-4>
- Jhaveri, A., Walsh, S. J., Wang, Y., McCarthy, M., & Gronowicz, G. (2008, November). Therapeutic touch affects DNA synthesis and mineralization of human osteoblasts in culture. *Journal of Orthopaedic Research: Official Publication of the Orthopaedic Research Society*, 26(11), 1541 1546. <https://doi.org/10.1002/jor.20688>
- Jibu, M., Hagan, S. B., Hameroff, S. R., Pribram, K. H., & Yasue, K. (1994). Quantum optical coherence in cytoskeletal microtubules: Implications for brain function. *Bio Systems*, 32(3), 195 209. [https://doi.org/10.1016/0303-2647\(94\)90043-4](https://doi.org/10.1016/0303-2647(94)90043-4)
- Joines, W. T., Baumann, S., & Kruth, J. (2012, September). Electromagnetic emission from humans during focused intent. *Journal of Parapsychology*, 76(2), 275 294. <http://www.rhine.org/images/jp/v76Fall2012/dJPF2012Joines.pdf>
- Joyce, J., & Herbison, G. P. (2015, April 13). Reiki for depression and anxiety. *Cochrane Database of Systematic Reviews*, 4. <https://doi.org/10.1002/14651858.CD006833.pub2>
- Kafatos, M. C., Chevalier, G., Chopra, D., Hubacher, J., Kak, S., & Theise, N. D. (2015, January). Biofield science: Current physics perspectives. *Global Advances in Health and Medicine*, 4(Supplement), 25 34. <https://doi.org/10.7453/gahmj.2015.011.suppl>
- Keshavarzian, A., Sedghi, S., Kanofsky, J., List, T., Robinson, C., Ibrahim, C., & Winship, D. (1992, July). Excessive production of reactive oxygen metabolites by inflamed colon: Analysis by chemiluminescence probe. *Gastroenterology*, 103(1), 177 185. [https://doi.org/10.1016/0016-5085\(92\)91111-G](https://doi.org/10.1016/0016-5085(92)91111-G)
- Kokubo, H., & Yamamoto, M. (2007, September). Discussion on standard evaluation method of non-contact healing using biophotons: Normality of J value and comparing non-contact healing with thermal/lighting conditions. *Journal of International Society of Life Information Science*, 25(2), 219 232. https://doi.org/10.18936/islis.25.2_219
- Kokubo, H., Yamamoto, M., & Kawano, K. (2007). Standard evaluation method of non-contact healing using biophotons. *Journal of International Society of Life Information Science*, 25, 30 39. https://doi.org/10.18936/islis.25.1_30

- Koval'chuk, L. V., Gankovskaya, L. V., Borisova, A. M., Golubeva, N. M., & Khanukhova, L. M. (1998, October). Effect of cytokines on the generation of active oxygen species by pulmonary and peripheral blood phagocytes. *Bulletin of Experimental Biology and Medicine*, 126(10), 1035–1037. <https://doi.org/10.1007/BF02447314>
- Kucera, O., & Cifra, M. (2013, November). Cell-to-cell signaling through light: Just a ghost of chance? *Cell Communication and Signaling: CCS*, 11, 87–811X-11-87. <https://doi.org/10.1186/1478-811X-11-87>
- Kumar, S., Boone, K., Tuszynski, J., Barclay, P., & Simon, C. (2016, November 7). Possible existence of optical communication channels in the brain. *Scientific Reports*, 6, 36508. <https://doi.org/10.1038/srep36508>
- Lakowicz, J. R. (2006). *Principles of fluorescence spectroscopy*. Springer.
- Liu, Q., Jin, L., Mahon, B. H., Chordia, M. D., Shen, F. H., & Li, X. (2013, August). Novel treatment of neuroinflammation against low back pain by soluble fullerol nanoparticles. *Spine*, 38(17), 1443–1451. <https://doi.org/10.1097/BRS.obo13e31828fc6b7>
- Madl, P., Verwanger, T., Geppert, M., & Scholkmann, F. (2017, September 12). Oscillations of ultra-weak photon emission from cancer and non-cancer cells stressed by culture medium change and TNF- α . *Scientific Reports*, 7, 11249-017-10949-z. <https://doi.org/10.1038/s41598-017-10949-z>
- Martin, W. C., & Wiese, W. L. (2006). Atomic spectroscopy. In G. W. F. Drake (Ed.), *Springer Handbook of Atomic, Molecular, and Optical Physics* (Vol. 1, pp. 176–197). Springer.
- Matos, L. C., Santos, S. C., Anderson, J. G., Machado, J., Greten, H. J., & Monteiro, F. J. (2017, May 12). Instrumental measurements of water and the surrounding space during a randomized blinded controlled trial of focused intention. *Journal of Evidence Based Integrative Medicine*, 2156587217707117. <https://doi.org/10.1177/2156587217707117>
- Muehsam, D., Chevalier, G., Barsotti, T., & Gurfein, B. T. (2015, January). An overview of biofield devices. *Global Advances in Health and Medicine*, 4(Supplement), 425–1. <https://doi.org/10.7453/gahmj.2015.022.suppl>
- Popp, F. A., Nagl, W., Li, K. H., Scholz, W., Weingartner, O., & Wolf, R. (1984). Biophoton emission: New evidence for coherence and DNA as source. *Cell Biophysics*, 6(1), 335–2. <https://doi.org/10.1007/BF02788579>
- Popp, F. A., Chang, J. J., Herzog, A., Yan, Z., & Yan, Y. (2002, January 21). Evidence of non-classical (squeezed) light in biological systems. *Physics Letters A*, 293(1–2), 98–102. [https://doi.org/10.1016/S0375-9601\(01\)00832-5](https://doi.org/10.1016/S0375-9601(01)00832-5)
- Prasad, A., Rossi, C., Lamponi, S., Pospíšil, P., & Foletti, A. (2014, October 5). New perspective in cell communication: Potential role of ultra-weak photon emission. *Journal of Photochemistry and Photobiology B: Biology*, 139, 475–3. <https://doi.org/10.1016/j.jphotobiol.2014.03.004>

- Rand, W. L. (2000). *Reiki, the healing touch: First and second degree manual*.
<https://www.ebay.com/p/119649229>
- Rubik, B. (2002, December). The biofield hypothesis: Its biophysical basis and role in medicine. *Journal of Alternative and Complementary Medicine*, 8(6), 7037–17.
<https://doi.org/10.1089/10755530260511711>
- Rubik, B., & Jabs, H. (2017). Effects of intention, energy healing, and mind-body states on biophoton emission. *Cosmos and History: The Journal of Natural and Social Philosophy*, 13(2), 227–247.
<http://cosmosandhistory.org/index.php/journal/article/viewFile/608/1027>
- Rubik, B., Brooks, A. J., & Schwartz, G. E. (2006, January). In vitro effect of Reiki treatment on bacterial cultures: Role of experimental context and practitioner well-being. *Journal of Alternative and Complementary Medicine*, 12(1), 7–13.
<https://doi.org/10.1089/acm.2006.12.7>
- Rubik, B., Muehsam, D., Hammerschlag, R., & Jain, S. (2015, January). Biofield science and healing: History, terminology, and concepts. *Global Advances in Health and Medicine*, 4(Supplement), 8–14. <https://doi.org/10.7453/gahmj.2015.038.suppl>
- Scordino, A., Baran, I., Gulino, M., Ganea, C., Grasso, R., Niggli, J. H., & Musumeci, F. (2014, October). Ultra-weak delayed luminescence in cancer research: A review of the results by the ARETUSA equipment. *Journal of Photochemistry and Photobiology B: Biology*, 139, 768–4.
<https://doi.org/10.1016/j.jphotobiol.2014.03.027>
- Stein, D. (1995). *Essential Reiki: A complete guide to an ancient healing art*.
<https://www.ebay.com/p/876144>
- Thrane, S., & Cohen, S. M. (2014, December). Effect of Reiki therapy on pain and anxiety in adults: An in-depth literature review of randomized trials with effect size calculations. *Pain Management Nursing: Official Journal of the American Society of Pain Management Nurses*, 15(4), 8979–08.
<https://doi.org/10.1016/j.pmn.2013.07.008>
- Van Wijk, E. P. A., Koch, H., Bosman, S., & Van Wijk, R. (2006, January). Anatomic characterization of human ultra-weak photon emission in practitioners of transcendental meditation (TM) and control subjects. *Journal of Alternative and Complementary Medicine*, 12(1), 31–38.
<https://doi.org/10.1089/acm.2006.12.31>
- Van Wijk, E. P. A., L dtke, R., & Van Wijk, R. (2008a). Differential effects of relaxation techniques on ultraweak photon emission. *Journal of Alternative and Complementary Medicine*, 14(3), 241–250. <https://doi.org/10.1089/acm.2007.7185>
- Van Wijk, E. P. A., Van Wijk, R., & Bajpai, R. P. (2008b). Quantum squeezed state analysis of spontaneous ultra-weak light photon emission of practitioners of meditation and control subjects. *Indian Journal of Experimental Biology*, 46(5), 345–352.

<http://nopr.niscair.res.in/bitstream/123456789/4470/1/IJEB%2046%285%29%20345-352.pdf>

- Van Wijk, E. P. A., Van Wijk, R., & Bosman, S. (2010). Using ultra-weak photon emission to determine the effect of oligomeric proanthocyanidins on oxidative stress of human skin. *Journal of Photochemistry and Photobiology B: Biology*, 98(3), 199–206. <https://doi.org/10.1016/j.jphotobiol.2010.01.003>
- van Wijk, R., van der Greef, J., & van Wijk, E. (2010). Human ultraweak photon emission and the yin yang concept of Chinese medicine. *Journal of Acupuncture and Meridian Studies*, 3(4), 221–231. [https://doi.org/10.1016/S2005-2901\(10\)60041-6](https://doi.org/10.1016/S2005-2901(10)60041-6)
- Van Wijk, R., Van Wijk, E. P., van Wietmarschen, H. A., & van der Greef, J. (2014). Towards whole-body ultra-weak photon counting and imaging with a focus on human beings: A review. *Journal of Photochemistry and Photobiology B: Biology*, 139, 39–46. <https://doi.org/10.1016/j.jphotobiol.2013.11.014>
- Wijk, E. P. A., & Wijk, R. V. (2005, April). Multi-site recording and spectral analysis of spontaneous photon emission from human body. *Forschende Komplementärmedizin Und Klassische Naturheilkunde [Research in Complementary and Natural Classical Medicine]*, 12(2), 96–106. <https://doi.org/10.1159/000083935>
- Wijk, R. (2001). Biophotons and bio-communication. *Journal of Scientific Exploration*, 15(2), 183–197.

RESEARCH ARTICLE

Mysticism and the Fine Structure Constant

PHILIP R. BROWN

Department of Foundational Sciences, Texas A&M University at Galveston
brownp@tamug.edu

Submitted January 31, 2018; Accepted March 5, 2020; Published September 15, 2020

<https://doi.org/10.31275/20201289>

Creative Commons License CC-BY-NC

Abstract—The mysticism relating to the fine structure constant, including the surprising connection between the number 137 and Kabbalah by means of gematria (first noted by Gershom Scholem in the 1950s), and the connection between Wolfgang Pauli's World Clock dream and formulas for the fine structure constant, is explored and expanded. A formula that relates the number 137 to the golden ratio and the Fibonacci sequence is explored in the context of Platonic and Pythagorean mysticism and various religious and esoteric traditions.

Keywords: fine structure constant; pi; quantization; archetypes; Kabbalah; polygons; Pythagoras; Plato; Carl Jung; mysticism; golden ratio; Fibonacci numbers; gematria

INTRODUCTION

An historical and ongoing aspiration of physicists is to express certain fundamental constants¹ or ratios (for example, the *coupling constants* and the ratio of the proton mass to the electron mass) in terms of simple formulas involving integers or transcendentals like π and e .

For example, in 1913 Gilbert N. Lewis and Elliot Q. Adams developed their theory of *ultimate rational units*, a system in which all universal constants could be expressed in terms of only integral numbers and π (Lewis & Adams, 1914). Before and since there have been many other attempts. Some references are Dattoli (2010), Krag (2003), Lunn (1922), Sherbon (2008, 2014), Stanbury (1983), and Vr laki et al. (2009b).

The Fine Structure Constant

A particular constant that has been the focus of these aspirations is the *fine structure constant*, usually denoted α , and defined by the formula

$$\alpha = \frac{e^2}{\hbar c}, \quad (1)$$

where e is the charge of an electron, \hbar is the reduced Planck's constant, and c is the velocity of light in a vacuum.² It has been known since the 1920s that α has the approximate value $1/137$.

The values for α and its reciprocal, based on experimental measurement using the *quantum Hall effect* or the *anomalous magnetic moment* of the electron (see Kinoshita, 1996, 1997), that are recommended by the Committee on Data for Science and Technology (CODATA), an interdisciplinary committee of the International Council for Science, in 2014, are

$$\alpha = 0.0072973525664(17) \quad (2)$$

and

$$\alpha^{-1} = 137.035999139(31) \quad (3)$$

(the numbers in parentheses specify the uncertainty in the last two digits). The above value for α^{-1} has recently been closely matched by employing measurements of cyclotron frequencies of single ions in Penning traps to obtain precise atomic mass measurements (Myers, 2019).

On the other hand, using the current recommended CODATA values (using cgs units) $e = 4.80320425(10) \times 10^{-10}$ statC, $\hbar = 1.054571800(13) \times 10^{-34}$ joule seconds, and $c = 29979245800$ cm/s, the fine structure constant and its reciprocal have the following values with the indicated uncertainty:

$$\alpha = 0.00729735127(40) \quad (4)$$

and

$$\alpha^{-1} = 137.036023(07) \quad (5)$$

Recent astronomical observations of the spectra of distant quasars suggest that α has a spatial or temporal variation of at most .001% since the beginning of the universe (about 13.7 billion years ago) (Cowie & Songaila, 1995; Savedoff, 1956; Webb et al., 1998, 2001, 2012). From the analysis of shifts of *thermal neutron-capture resonances* of rare earth elements of natural fission reactors which operated about 2 billion years ago at Oklo (in Gabon), it has been determined that the time variation of α since then is about 0.00001% (Damour & Dyson, 1996).

There have also very recently been reports of evidence for a varying speed of light, for example by Afshordi and Magueijo (2016) who suggested that the speed of light was higher when the universe was in its infancy. In some other theories, the speed of light could be decreasing gradually (Barrow, 1999).

As evidenced by the extensive literature on the topic, there have been many interesting attempts to produce a simple and correct expression for α on the basis of a theory of physics and in accordance with historical, aesthetic, and philosophical expectations. Indeed, as we will elucidate below, there has developed a mythos relating to α which seems to have very ancient roots in mysticism and alchemy and, in particular, to the connection of the number 137 to Kabbalah. The number 137 has also permeated popular culture.³

This article should be read in the context of a non-materialistic or non-naturalistic view of Nature. This would include Carl Jung's idea of the collective unconscious that is responsible for universal cultural images or symbols that he referred to as archetypes. Furthermore, the formulas and numerical "coincidences" that we discover in this article are inspired by and interpreted within a cultural and historical context; for example, formula (7) below is derived from a value for the fine structure constant suggested by the physicists Lunn and Heisenberg (as explained in the next section) and interpreted in terms of Wolfgang Pauli's World Clock Dream; and the formula $137 = 5 + 24 + 108$ which relates the fine structure constant to the Fibonacci sequence in an intriguing way is interpreted in terms of Pythagorean mysticism, Plato's mystical numbers, special numbers in religion, and gematria. Why these numerical "coincidences" relating the fine structure constant, classical culture, and (esoteric) religion should exist, we do not speculate about besides mentioning Jung's proposal of the *unus*

mundus, of which the small counting numbers are the archetypes, and the related Pythagorean belief that numbers mediate between the divine and physical realms.

While mystical tradition and science apparently seek truth within different belief systems and epistemologies, there is some evidence (Werner's Heisenberg's experience in India that we will mention below, for example) for a commonality to be found between them. Numerology could be one place to look for it.

The Lunn–Heisenberg Constant

In this article we investigate the number

$$\frac{\pi/2}{6^3} = 0.007272205621 \dots \quad (6)$$

which was introduced in 1922 as one of a few possible algebraic expressions for α by the Chicago physicist Arthur C. Lunn (Lunn, 1922). It was also suggested independently by Werner Heisenberg in 1935 when he stated the following in a letter to Neils Bohr (Heisenberg, 1934):

Lately, I have thought much about $\frac{e^2}{\hbar c}$. . . If only for fun, . . . I write you the equation $\frac{e^2}{\hbar c} = \frac{\pi}{2^4 3^3}$ that occurred to me while playing with $\frac{e^2}{\hbar c}$.

Thus, it is appropriate for the constant to be named the *LunnHeisenberg constant*.

Its defect, as we see by comparing formulas (6) and (2), is that it is not accurate. However, we will demonstrate below that a very interesting observation can be made about its reciprocal $\frac{6^3}{\pi/2}$ that further strengthens the connection between Kabbalah and the fine structure constant, and the inaccuracy can be lessened by means of a replacement for π , as we describe next.

The physicist James Gilson states (2012) that π can be replaced or generalized by the perimeter of a regular polygon. He refers to this

as “quantization” (of π) and comments that motion around a polygon must occur with directional jumps, whereas motion round a circle can take place classically with a continuously changing direction of motion.

Below we will demonstrate that if π is “quantized” in this way by means of a 31-sided regular polygon that circumscribes a circle or a 22-sided regular polygon that equalizes the area of a disk, then the Lunn̄Heisenberg constant obtains a closer approximation to the value of the fine structure constant. Furthermore, if a circle is approximated by a semi-regular 36-sided polygon which incorporates the ratio 2:5 (or 9:5), as will be explained below, then this results in a significantly better approximation to the fine structure constant. Thus, we suggest the following formula for α :

$$\alpha \approx \frac{1}{6^3} (4 \sin(\pi/18) + 5 \tan(\pi/18)) = 0.0072973500657 \dots^4 \quad (7)$$

The corresponding value for the reciprocal is

$$\alpha^{-1} \approx 137.03604609684 \dots \quad (8)$$

These values are almost within the estimated uncertainty of the values given in formulas (4) and (5), and the value of α in formula (7) varies from the CODATA value given in formula (2) by 0.000035% and so is well within the observed cosmic variation of α and comparable to the Oklo natural fission reactor measurements mentioned above.

It is a fact that there is not a small probability of discovering a number that approximates α^{-1} to one part in a million by playing with (a root of) a product of integral powers of 2, 3, 5, and π , for example (Peres, 1971). However, such numbers may be difficult to find except by means of an exhaustive computer search. The inclusion of trigonometric ratios allows for the possibility of finding more accurate approximations. Formula (7) approximates α^{-1} to one half part in ten million (by comparison of formulas (8) and (3)) and is discovered by means of a geometric construction.

The next section is an overview of the discovery of the fine structure constant in the 20th century and a summary of some recent developments.

THE DISCOVERY OF THE FINE STRUCTURE CONSTANT

In 1915 Neils Bohr attempted to incorporate relativity into his theory of the atom (Bohr, 1913). Based on his work, in 1916 Arnold Sommerfeld derived the formula (Sommerfeld, 1915, 1916)

$$E_{n,k} = \frac{Z^2}{n^2} \left\{ 1 + \left(\frac{e^2}{\hbar c} \right)^2 \left[\frac{n}{k} - \frac{3}{4} \right] \right\} (2.7 \times 10^{-11} \text{ergs}) \quad (9)$$

for the orbital energy levels of an electron in the outermost shell of an atom. (This is actually the first order approximation of a more complicated formula that he derived.) Here k and n are quantum numbers that indicate the possible orbits of electrons; Z is the number of protons in the nucleus. The interesting property of the ratio in formula (1) is that it is dimensionless, i.e. the units of e , \hbar , and c cancel out (see Born, 1935, p. 539), and it is a “human-sized” number (approximately $1/137$) while the factors c , e , and \hbar are either very large or very small. Also, the relative smallness of the ratio, i.e. $\alpha \ll 1$, allows the use of *perturbation methods* in *Quantum Electrodynamics* using power series in α . Its significance in formula (9) is to set the scale of the splitting of the spectral lines that are emitted by an atom when it is illuminated by light. For this reason, Sommerfeld named it the *fine structure constant*. His colleague Friedrich Paschen experimentally measured its value to be approximately 0.00725. The physicist Arthur Haas, speaking on behalf of the physics community a few years later, stated that Paschen’s measurement “implies a brilliant success not only of the ideas of Bohr and Sommerfeld but also of the theory of relativity” (Haas, 1924, p. 45).

The fine structure constant can be conceptualized or interpreted in different ways: for example, as $(e^2/\hbar)/c$ it is the ratio speed of the electron in the ground state of Bohr’s hydrogen atom model to the speed of light; as $\frac{(e^2/r) \times (r/c)}{\hbar}$ where two elementary particles are separated by distance r , it is the ratio of the *electrical action* to the *quantum action*; and as $\frac{e^2/mc^2}{\hbar/mc}$, where m is the mass of the electron, it is equal to the classical electron radius divided by its *reduced Compton wavelength* (see Born, 1935; Gilson, 1996; Sherbon, 2014). Furthermore, α can be regarded as the *electromagnetic coupling constant* because it determines the strength of the interaction between electrons and photons at low energies

(there are another three coupling constants referring to the weak, strong, and gravitational interactions) (Krag, 2003, p. 396). It also determines the order of magnitude of all nuclear motions, for instance velocities of gas molecules and vibrations of crystal lattices (Born, 1935, p. 357).

In 1925 the Liverpool physicist James Rice attempted to link in a single formula the fine structure constant to cosmic quantities such as the radius of the universe, the electromagnetic radius of the electron, and the gravitational radius of the electron (Rice, 1925).

Confidence in Sommerfeld's formula was strengthened after it was shown to result from Paul Dirac's derivation in 1928 of the linear relativistic wave equation for an electron (Krag, 2003, pp. 407–408). Werner Heisenberg (1934) stated that

... a contradiction-free union of the conditions of quantum theory with the corresponding predictions of field theory is only possible in a theory that provides a particular value for Sommerfeld's constant.

Arthur Eddington caused a stir with a pair of papers (1929, 1931), respectively, in which he claimed that α^{-1} could be calculated by counting the number of states of a pair of electrons:

$$\alpha^{-1} = 16 + \frac{1}{2} 16(16 - 1) + 1 = 137.$$

His contemporaries found his arguments obscure; however, he received support from some physicists, including Pascual Jordan who agreed that it should follow from a complete understanding of the laws of quanta and relativity that the fine structure constant has just the value it has (Jordan, 1937). Max Born (1935) made the same argument, in which he stated that

A perfect theory should be able to derive the number α by purely mathematical reasoning.

Furthermore, he believed that the problem of the proton-to-electron mass $\frac{M}{m} \approx 1840$ was somehow connected to α .

In 1948 Julian Schwinger proposed that the cause of the

discrepancy between the predicted value of the *magnetic moment of the electron* and experimental data was the result of interactions of the electron with quantum fluctuations of the vacuum. By calculation of these interactions he proposed multiplying the magnetic moment by a *g factor* which had the value $\frac{\alpha}{2\pi}$ to produce a corrected value known as the *anomalous magnetic moment of the electron*. In 2017 a semi-classical correction of the magnetic moment of the electron by Oliver Consa involving *toroidal solenoid geometry* gave a slightly improved g-value of $\sqrt{1 + \frac{\alpha}{\pi}}$ (Consa, 2018).

Regarding the value of α , Richard Feynman famously stated (1988):

It has been a mystery ever since it was discovered more than fifty years ago, and all good physicists put this number up on their wall and worry about it . . .

It is impossible to give an account here of all of the proposed formulas for α that have appeared in the literature. Some recent formulas are discussed by Gilson (1997), which presents his own formula

$$\alpha = \frac{29 \cos(\pi/137) \tan(\pi/(139 \times 29))}{\pi} = 0.00729735253186 \dots \quad (10)$$

which is probably to date the most accurate formula and it is calculated from a model of atomic physics and relativity. This formula is difficult to interpret, however, and the numbers $n_1 = 137$ and $n_2 = 29$ have to be selected as the best input into the formula $\alpha(n_1, n_2) = n_2 \cos(\pi/n_1) \tan(\pi/(n_1 \times n_2)) / \pi$ where n_1 and n_2 are integers.

For Schönfeld and Wilde (2008, 2012), the formula

$$\frac{1}{\alpha} = \pi^4 \sqrt{2} \frac{m_{qm}}{m_0} = 137.035999252 \quad (11)$$

is derived in terms of the *rest mass* m_0 of the electron and its *quantum-mechanical fraction* m_{qm} .

Gorelik (2009) and Onstott (2019) have compiled formulas for α or α^{-1} . The latter includes the formula discovered by W. A. Harrington in 2015.

$$\alpha^{-1} = 16(e - 1)^4 - \sqrt{2(e - 1)^2} = 137.045368 \dots$$

NUMBERS AND MYSTICISM

Mysticism in Philosophy and Physics

According to the *Stanford Encyclopedia of Philosophy* (Gellman, 2014), *mysticism* would, in general, best be thought of as a constellation of distinctive practices, discourses, texts, institutions, traditions, and experiences aimed at human transformation, variously defined in different traditions. A *mystical experience* is a (purportedly) super sense-perceptual or sub sense-perceptual experience granting acquaintance of realities or states of affairs that are of a kind not accessible by way of sense perception, somatosensory modalities, or standard introspection. An example would be an awareness of God (a reality) affording an awareness of one's utter dependence on God (a state of affairs).

In the ancient world *mystics* were those initiated in the *mystery religions*. Indeed, the term mysticism is originally derived from the Greek word *μυω* meaning "to conceal."

Relating to mysticism in modern times is the view that consciousness imposes "downward causation," i.e. mental events can act to cause physical events, an idea introduced by the social scientist Donald T. Campbell (1974) and developed by the neuropsychologist Roger Sperry (1987). More generally, downward causation describes a causal relationship from higher levels of a system to lower-level parts of that system. This is opposed to *naturalism*, the idea or belief that only natural (as opposed to supernatural or spiritual) laws and forces operate in the world.

With the discovery of the energy-matter equivalence by Albert Einstein, wave-particle duality by the pioneers of quantum mechanics, and non-locality (quantum entanglement), some physicists have been led to descriptions of the physical world that contain elements and concepts of Eastern mysticism. For example, the 1975 book by physicist Fritjof Capra *The Tao of Physics: An Exploration of the Parallels Between Modern Physics and Eastern Mysticism* was a bestseller and published in 23 languages. In a video made in the 1980s (Koole, 1986), Capra says

In deep meditative experience the mystics also say that the observer and observed fuse; they can no longer be separated. But they go further: They go to the point where there is no distinction. The entire being dissolves into the universe . . .

Later in the video he mentions that he had shown his manuscript of *The Tao of Physics* in 1973 to Werner Heisenberg, who said that he was well aware of the parallels and open to them. Furthermore, Heisenberg told him that when he had been a guest of the famous poet and philosopher Rabindranath Tagore in India, Tagore had told him that Indian culture was built on the premises of indeterminacy, relativity, interconnectedness, and the dynamic nature of the world, the very worldview that was emerging in quantum physics.

The physicist David Bohm was a proponent of the fundamental idea that beyond the visible, tangible world there lies a deeper, implicate order of undivided wholeness. Moreover, he proposed that the whole universe can be thought of as a flowing hologram, or *holomovement*, in which a total order is contained, in some implicit sense, in each region of space and time (Bohm, 1980).

Kabbalah and Number Mysticism

Kabbalah is a Jewish branch of mysticism that emerged in 12th-century Europe and is based on the Zohar, a collection of written, mystical commentaries on the Torah (Scholem, 1990). The aim of Kabbalah is to unite the individual with God.

Number mysticism, which holds the view that numbers have not only a quantitative meaning, but also possess an inherent quality independent of their numerical value is a component of Kabbalah because numbers are associated with the letters of the Hebrew alphabet. The practice of assigning numbers to words is known as *gematria* (Miller, 2009, p. 258).

The connection between the fine structure constant and Kabbalah was discovered in the 1950s when the scholar of Jewish mysticism Gershom Scholem pointed out that the numerical values of the letters of the word “Kabbalah” in Hebrew add up to 137 (i.e. 5 + 30 + 2 + 100). Furthermore, as explained by Miller (2009, p. 258), two key words in Kabbalah are “wisdom,” which has a numerical value of 73, and “prophecy,” which has a numerical value of 64, and $73 + 64 = 137$. God himself is One. The letters of the word “wheel” in Hebrew also add up to 137. The number 72 is also important in Judaism because the three consecutive verses from Exodus 14:19–21 each contain 72 Hebrew

letters which can be arranged as 72 triplets of letters (a total of 216 letters), with the order of the letters in the middle set reversed, to form the 72 names of God (Wisnefsky, 1993).

Western number mysticism leads back to Pythagoras. According to him, number is the *archetype* of all things (Robertson, 1995, p. 96). To the ancient Greek philosophers, archetypes were basic forms that existed on the spiritual plane prior to shaping everything that came into material existence. In the Pythagorean philosophy, number is the mediator between the divine and the earthly and so operations performed with numbers can affect the things related to them. The followers of Pythagoras initiated the sciences of geometry and number theory with their study of polygons, the proof of the Pythagorean Theorem, and investigations of triangular, square, and perfect numbers (numbers that are the sum of their divisors).

The 20th-century philosopher Carl Jung considered archetypes to be psychic patterns in the collective unconscious that we draw from, especially when we are in a dreaming state. He speculated that there was a unitary reality – the *unus mundus* – that underlay both mind and matter, and that the primary archetypes of this reality were the simple counting numbers (Robertson, 1995, p. 280).

Any discussion of mysticism would be incomplete without the introduction of the golden ratio and the Fibonacci sequence. Scott Olsen eloquently states in the introduction of his book on the Golden Section (Olsen, 2006) that there is

a secretive tradition that centers on a study of number, harmony, geometry, and cosmology that stretches back through the mists of time into Egyptian, Babylonian, Indian, and Chinese cultures,

and that

the great Pythagorean philosopher, Plato, in his writings and oral teachings, hinted, though enigmatically, that there was a golden key unifying the mysteries.

Therefore, if 137 is truly a mystical number it should have a deep connection to the golden ratio and the Fibonacci sequence.

The World Clock Dream

In his long relationship with the physicist Wolfgang Pauli, Jung interpreted many of Pauli's dreams, including the famous dream of the *World Clock*, which involves a vertical and a horizontal disk having a common center and supported by a black bird. Surrounding both discs is a golden ring. Each disk has 32 segments and on the horizontal disk stands four little men, each holding a pendulum. This is illustrated by Vr laki and N dai (2008), who posited that this entire configuration represents an algebraic archetype from which, by means of an analysis of the temporal and spatial structures, it is possible to derive the formula

$$1 + 2 \times 32 + 2 \times (32 + 4) = 1 + 64 + 72 = 137. \quad (12)$$

They also regard as especially important the formula

$$\alpha^{-1} \approx 4\pi^3 + \pi^2 + \pi = 137.036303776 \quad (13)$$

which was discovered along with some other formulas possibly relating elementary particle masses to the number π by a factory worker in the United Kingdom in 1983 (Stanbury, 1983). The reason for this is that the number $4\pi^3 + \pi^2 + \pi$ can be interpreted as being symbolically isomorphic to three power-like rhythms and the four space-like quaternion of the dream.

In mythology birds are a symbol of spiritual transcendence (Jung, 1964, pp. 161–157). Vr laki and Nd ai (2008, p. 86) mention that in the Pauli–Jung correspondence the black bird represents the female symbolic figure of *anima* or wisdom goddess, which is suited to the number 7.

As a correction to formula (13), the formula

$$\alpha^{-1} \approx 4\pi^3 + \pi^2 + \pi + \frac{\delta_x}{1 - \delta_x} \frac{\delta_x}{1 + \delta_x} = 137.035999066 \dots \quad (14)$$

$$\text{where } \delta_x = \frac{2\pi}{x} \text{ and } x = 360$$

is presented by Vr laki et al. (2009a). The correctional term $\frac{\delta_x}{1 - \delta_x} \frac{\delta_x}{1 + \delta_x}$

is a symbol of the two disks that are orthogonal to each other in the dream. Relating to this, Vr laki and Rudas (2009) introduce and discuss the *twin concept*. This involves complementary relationships in a self-regulating system, for example *backward and forward, past and future, or positive and negative*.

As an attempt to explain the “many-valuedness” of α suggested by formulas (2) and (4), it is suggested by Vr laki et al. (2009a) that the fine structure constant can be treated as a *fuzzy number archetype*. *Fuzzy sets* and *fuzzy logic* were introduced into physics in order to present a model of Euclidean spacetime in which at scales less than a certain length the notion of a point does not exist (Madore, 1992). A *fuzzy number* is a generalization of an ordinary real number in the sense that it does not refer to one single value but rather to a connected set of possible values, where each possible value has its own weight between 0 and 1 determined by a membership function. A helpful introduction to this topic was written by Del Castillo-Mussot and Dias (1993).

The Lunn–Heisenberg Constant and Base Six

In base 6 arithmetic $\frac{1}{\pi} \approx 0.15243102213_6$.⁵ By substituting this in the reciprocal of the Lunn–Heisenberg constant, we obtain

$$\begin{aligned} \alpha^{-1} &\approx \frac{2 \cdot 6^3}{\pi} = 2 \cdot 6^3 \cdot 0.15243102213_6 \\ &= 2 \cdot 6^3 \left(\frac{1}{6} + \frac{5}{6^2} + \frac{2}{6^3} + \frac{4}{6^4} + \frac{3}{6^5} + \frac{1}{6^6} + \frac{0}{6^7} + \frac{2}{6^8} + \frac{2}{6^9} + \dots \right) \\ &= 72 + 60 + 4 + \frac{4}{3} + \frac{1}{6} + \frac{1}{108} + 0 + \frac{1}{1944} + \frac{1}{11664} \dots \end{aligned}$$

Alternatively, if π is replaced by the quantized value $\pi_{2/5,18}^\alpha$, which we will define in formula (34) below, then (also in base 6)

$$\begin{aligned} \alpha^{-1} &\approx \frac{2 \cdot 6^3}{\pi_{2/5,18}^\alpha} = 2 \cdot 6^3 \cdot 0.15230352051_6 \\ &= 2 \cdot 6^3 \left(\frac{1}{6} + \frac{5}{6^2} + \frac{2}{6^3} + \frac{3}{6^4} + \frac{0}{6^5} + \frac{3}{6^6} + \frac{5}{6^7} + \frac{2}{6^8} + \dots \right) \\ &= 72 + 60 + 4 + 1 + 0 + \frac{1}{36} + \frac{5}{648} + \frac{1}{1944} \dots \end{aligned}$$

This calculation generates the Kabbalistic formula

$$72 + 60 + 4 + 1 = 73 + 64 = 137 \quad (15)$$

that was mentioned above. It also matches formula (12) resulting from the interpretation of the World Clock Dream by Vr laki et al.

The Number 137 as a Code for the Fibonacci Sequence

The Fibonacci sequence, celebrated for its ubiquity in mathematics, science, and nature, is the infinite sequence of integers

$$0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, \dots \quad (16)$$

which is characterized by the property that every digit in the sequence is the sum of the preceding two digits. It is named after the Italian mathematician Leonardo of Pisa, known as Fibonacci. In his book *Liber Abaci* published in 1202 he introduced this sequence to mathematics in Western Europe. It is an important fact that the sequence of ratios of successive Fibonacci numbers

$$\frac{2}{1}, \frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{13}{8}, \frac{21}{13}, \frac{34}{21}, \dots \quad (17)$$

converges to the *golden ratio* $\frac{1+\sqrt{5}}{2}$.

To explain the connection between the Fibonacci sequence and the number 137 we first observe that its expression in base 6 is

$$345_6 = 3 \times 6^2 + 4 \times 6 + 5 = 108 + 24 + 5 = 137. \quad (18)$$

The number 5, as the fifth non-zero element of the Fibonacci sequence, can be regarded as a reference to the Fibonacci sequence. To see how the numbers 108 and 24 relate to the Fibonacci sequence we will look at the sequence that can be derived from it by calculating the *digital roots* of the numbers of the sequence.

The digital root or *repeated digital sum* of a natural number is the single digit obtained by an iterative process of summing the digits (of the number) and, on each iteration, using the result from the previous

iteration until a single-digit number is reached. For example, the digital root of 11664 is 9 because $1 + 1 + 6 + 6 + 4 = 18$ and $1 + 8 = 9$. If the digital root of a number n is the number p , then $n-p$ is a multiple of 9 and (in modular arithmetic) $n \equiv p \pmod{9}$ (see Wikipedia, 2016). Therefore, the number 9 behaves like “0” in the calculation of the digital root of a number. This is the basis of the method of *casting out nines* (see Wikipedia, n.d.). For example, the number 729735 has the same digital root as 735.

If we calculate the digital roots of the numbers of the Fibonacci sequence, we obtain the sequence

(0), 1, 1, 2, 3, 5, 8, 4, 3, 7, 1, 8, 9, 8, 8, 7, 6, 4, 1, 5, 6, 2, 8, 1, (9), 1, 1, . . .

which is a repeating sequence of digits, beginning with a (9) on the first repetition and subsequent repetitions (see Wikipedia, 2016). There are 24 digits in each repeating string, and (as mentioned in Leeds, 2013) the sum of the 24 digits in the first string (starting with 0) is 108.

Pentagons, Pythagorean Triples, and the Golden Ratio

There is a connection between the two formulas (15) and (18) and the geometry of a pentagon: The angles at the vertices of a pentagon are 108° and the diagonals intersect at angles of 108° and 72° . Furthermore, the two diagonals drawn from any vertex trisect the angle at the vertex into three angles which are each equal to 36° .

The number 6 is a perfect number and a triangular number and the number 36 is also a triangular number obtained from the Greek *tetractys* (a triangular figure consisting of ten points arranged in four rows) by doubling the number of points on each side. For this and many other reasons (Keppler et al., 1997, pp. 133–136), the number 36 was revered by the Pythagoreans. The 36th triangular number is the occult number 666.

The numbers 36, 60, 72, and 132 also have a connection in the existence of certain regular polyhedra constructed only from pentagons having so many faces (Lanzi, 2017; RobertLovesPi, 2016, 2015; Weisstein, 1999).⁶

The expression 345_6 of 137 in base 6 (i.e. formula (18)) is suggestive of

a connection between the fine structure constant and the Pythagorean Theorem and Pythagorean triples, in particular the triple (3, 4, 5). (If any three natural numbers a , b , c satisfy the property of the Pythagorean Theorem, i.e. $a^2 + b^2 = c^2$, then they form the sides of a right triangle and they are called a Pythagorean triple.) It is a fact that in every Pythagorean triple (a , b , c), the number 3 is always a factor of exactly one of a and b , the number 4 is always a factor of exactly one of a and b , the number 5 is always a factor of exactly one of the three numbers a , b , and c , and the largest number that always divides $a \cdot b \cdot c$ is 60 (see Wikipedia, 2018).

It is well-known (Bogomolny, 1996) that the golden ratio appears as the ratio of a diagonal to a side of a regular pentagon. The golden ratio is also expressed elegantly in the geometry of a 3-4-5 right triangle (Brown, 2016, p. 327). We mention also the interesting formula

$$3^3 + 4^3 + 5^3 = 6^3, \quad (19)$$

which gives a connection between the number $6^3 = 216$ and the triple (3, 4, 5).

The author Bonnie Gaunt has discovered many surprising connections between the gematria of phrases and names in the bible (in their Greek or Hebrew spelling), astronomical data (including planetary and solar geometry), and the 3-4-5 right triangle, in particular. For example, she explains that the gematria of “Lord Jesus Christ” in its Greek spelling is the number 3168, and a 3-4-5 right triangle with hypotenuse equal to the radius of the Earth (3960 miles) has one side of length 3168 miles (Gaunt, 2000).

The Significance of 108 in Religion, Mysticism, and Astronomy

The number 108 is considered sacred by the Dharmic Religions, such as Hinduism, Buddhism, and Jainism (Wikipedia, 2017). Traditionally, malas, used for counting the repetitions of a mantra, come as a string of 108 beads (plus the “guru bead”).

As explained by Margaret Starbird (2003), the numbers 108 and 1080 represent the Sacred Feminine in Christianity. This is a consequence of the esoteric tradition of sacred number, geometry, and gematria having passed into Christianity through the mystery schools of

the Hellenized world. The number 1080 was associated with the moon because it approximated the radius of the moon when measured in miles. In the Greek method of gematria, the letters of the words “Holy Spirit” and “Earth Spirit,” which are anagrams in their Greek spelling, add up to 1080. Also, the spelling of “dove” in Greek has a gematria of 801. For this reason, the Holy Spirit and Earth Spirit are both linked by gematria to the lunar/feminine principle and the dove. Furthermore, the value the first Greek letter alpha is 1, and the value of the last Greek letter omega is 800. Their sum 801 is therefore associated with the “Alpha and Omega,” an epithet of the “Holy One” which represents the eternal union of all opposites.

Michell (2008, p. 209) mentions that the words Prophecy and Wisdom in their Greek spelling both have a gematria of 1080, thus giving these two words another connection to the number 137 and the fine structure constant.

H. Spencer Lewis (1979) mentions an ancient and mysterious tradition of unknown origin that requires a periodicity of active and inactive cycles of the Rosicrucian Order, each of which lasts for 108 years. He also mentions that the number 108 is significant in itself to all occult students.

In astronomy, the distance between the Earth and the sun is approximately 108 times the diameter of the sun, and the distance between the Earth and the moon is approximately 108 times the diameter of the moon⁷ (this is the reason the moon precisely covers the sun during a total eclipse). What’s more, the diameter of the sun is approximately 108 times the diameter of the Earth.

There is an interesting discussion about possible reasons for the importance of 108 from Koenraad Elst (2003).

Plato’s Mystical Numbers

Two other numbers of interest relating to formula (18) are the products $24 \times 108 = 2592$ and $5 \times 24 \times 108 = 12960$. The former relates to the *Platonic Year* or *Great Year* (25,920 years), which is the amount of time (according to Plato) required for a complete precession of the equinoxes (Barton, 1908), i.e. an *ecliptical year*, and the latter relates to the number 12,960,000 that is widely believed to be Plato’s *Nuptial*

Number or Sovereign Number, which he introduces in a passage in book VIII of the *Republic*, by means of a lengthy and convoluted description, as a number that controls the formation of the world (Barton, 1908).

THE QUANTIZATION OF π

As mentioned above, we will explore what happens when we replace the numerator π in the LunnñHeisenberg constant by certain approximations (i.e. quantizations) of π . Readers who are less mathematically inclined may skip over this section.

As preparation for this we will first review the problem of calculating π historically. In classical antiquity there were essentially two different methods used to find an approximation to π that may conveniently be referred to here as the Greek method (see Beckman, 1971, pp. 64ñ67) and the Egyptian method (see Beckman, 1971, pp. 24ñ25).⁸

The Approximation of π (The Greek Method)

The first scientific engineer, Archimedes of Syracuse (born in 287 BC), described his method of approximating π in his treatise *On the Measurement of a Circle*. In this he demonstrated that a circle can be closely approximated arbitrarily by an inscribed or circumscribed regular polygon, as in Figure 1 below with inscribed and circumscribed hexagons.

If the radius of the circle is 1, then the areas of the inscribed and circumscribed hexagons are $3 \sin \pi/3$ and $6 \tan \pi/6$, respectively, and the corresponding perimeters are $12 \sin \pi/6$ and $12 \tan \pi/6$, respectively. The corresponding approximations to π determined by the inscribed hexagon are

$$\begin{aligned} \pi &\approx 3 \sin \pi/3 = 2.598 \dots \quad (\text{by comparison of areas}) \\ \pi &\approx 6 \sin \pi/6 = 3 \quad (\text{by comparison of perimeters}). \end{aligned}$$

For the circumscribed hexagon, the area and perimeter approximations both determine that $\pi \approx 6 \tan (\pi/6) = 2\sqrt{3} \approx 3.4641 \dots$

Archimedes determined that $3.14085 \approx 223/71 < \pi < 22/7 \approx 3.14286$ by performing calculations relating to inscribed and circumscribed polygons with 96 sides.

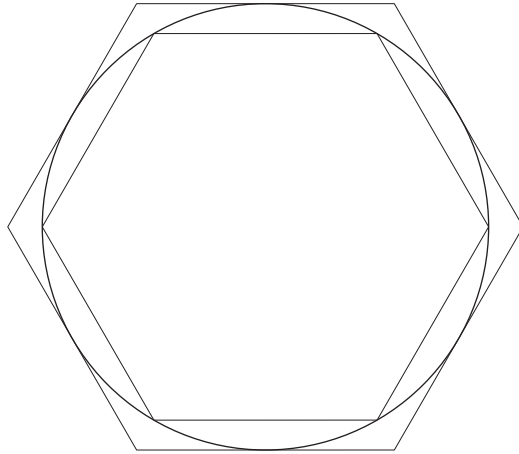


Figure 1. The Greek method of calculating π .

For a circumscribed polygon with an unspecified number (n) of sides, the formula above generalizes to

$$\pi \approx n \tan (\pi/n) . \tag{20}$$

A variation of the Archimedean method is to approximate a circle by a polygon which has the same area as the disk enclosed by the circle. For example, the area of the inscribed hexagon above is $3 \sin (\pi/3)$. Therefore, the radius of the circle that contains the same area is

$\sqrt{\frac{\sin(\pi/3)}{\pi/3}}$. In this case the hexagon is *area equalizing* (for the circle with

this radius) and the circle *interpolates* the hexagon. Its perimeter (as calculated above) is $12 \sin \pi/6$. By comparison of the perimeter of the hexagon with the circumference of the interpolating circle we have

$$12 \sin(\pi/6) \approx 2\pi \sin \sqrt{\frac{\sin(\pi/3)}{\pi/3}}$$

or

$$\pi \approx \frac{6 \sin \left(\frac{\pi}{6}\right)}{\sqrt{\frac{\sin(\pi/3)}{\pi/3}}} = 3.2989 \dots$$

The general formula for approximating π by means of an area equalizing polygon with n sides is

$$\pi \approx \frac{n \sin(\pi/n)}{\sqrt{\frac{\sin(2\pi/n)}{2\pi/n}}} \quad (21)$$

An alternative is to approximate a circle by a polygon which is *perimeter equalizing*. It is left to the reader to check that the approximation to π which results from this is the same as formula (20).

The Approximation of π (the Egyptian Method)

The Egyptian method is described by Ahmes in a papyrus scroll found in Thebes and acquired by the Scottish Antiquary Henry Rhind in 1858. It is now mostly displayed in the British Museum. A part which was discovered in 1922 is now displayed in the Brooklyn Museum. In problem no. 50 in the papyrus, Ahmes describes the approximation of a disk by an octagon formed from a grid of squares, as shown in Figure 2.

The octagon in this case can be referred to as a *semi-regular* rather than a *regular* octagon because sides of the same length alternate with sides of a different length.

The circle has a diameter of 9 units and each square has a side-length of 3 units. Therefore, the area of the disk $\pi \left(\frac{9}{2}\right)^2$ is approximately equal to the area of seven squares, which is $7(3)^2 = 63$. Ahmes preferred the number 64, which is the area of a square of side-length 8. Thus, he arrived at $\pi \approx 4 \times \left(\frac{8}{9}\right)^2 = 3.16049 \dots$

Another way to calculate an approximate value of π from the same diagram is to use the perimeter $4(3) + 4(3\sqrt{2})$ of the octagon as an approximation of the circumference $2\pi\left(\frac{9}{2}\right)$ of the circle. This produces $\pi \approx \frac{4(1 + \sqrt{2})}{3} = 3.219$.

Furthermore, it is possible to generalize the construction by replacing the segments of the octagon of length 3 contained in the sides of the surrounding square by segments of a different length (labeled x in Figure 3) centered in each side of the square.

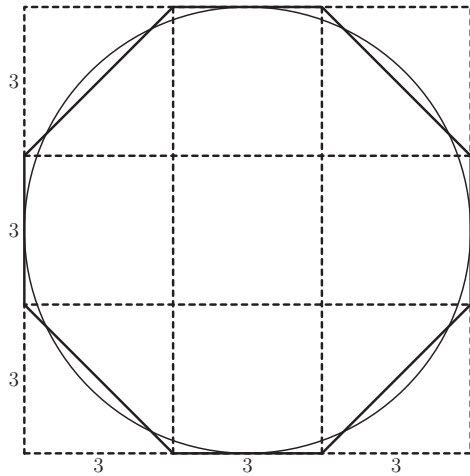


Figure 2. The Egyptian method of calculating π .

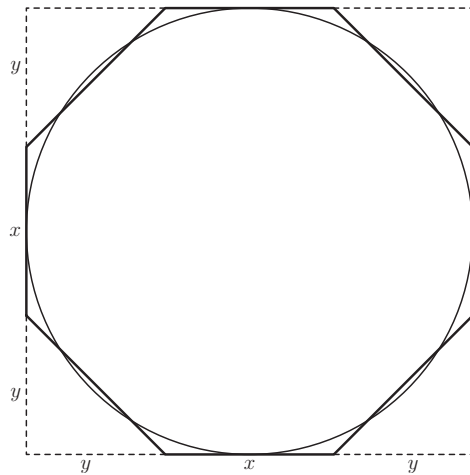


Figure 3. A generalization of the Egyptian method.

If we work with a diameter of 2 (instead of 9) for the circle, then $x + 2y = 2$ and the area of the octagon is $x^2 + 4xy + 2y^2$ or $2 + 2x - \frac{x^2}{2}$ and its perimeter is $4(x + \sqrt{2})$ or $2(2 - \sqrt{2})x + \sqrt{2}$. Therefore, there are the following two possible approximations for π for any value of x between 0 and 2:

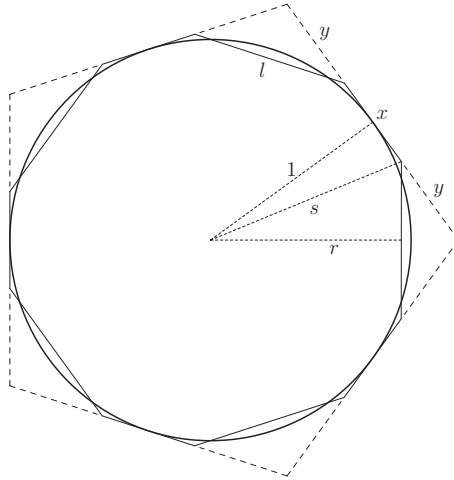


Figure 4. Replacing a square by a pentagon.

$$\pi \approx 2 + 2x - \frac{x^2}{2} \quad (\text{by comparison of areas})$$

$$\pi \approx (2 - \sqrt{2})x + 2\sqrt{2} \quad (\text{by comparison of perimeters}).$$

Ahmes' construction corresponds to $x = 2/3$. If $x = 9/17$, for example, then the second formula above gives $\pi \approx 3.1385$.

Ahmes' construction can be generalized further by replacing the surrounding square by any other regular polygon. The diagram in Figure 4 shows the construction with the square replaced by a regular pentagon to produce a semi-regular decagon.

The symbols l , r , and s were inserted in order to facilitate the following calculation of the area and perimeter of the semi-regular decagon, which we will denote as $A_5(x)$ and $P_5(x)$, respectively. (We assume that the pentagon circumscribes a circle of radius 1.) Using trigonometry and the properties of right triangles,

$$\frac{x}{2} + y = \tan \frac{\pi}{5}, \quad (22)$$

$$r^2 + \left(\frac{l}{2}\right)^2 = s^2 = 1 + \left(\frac{x}{2}\right)^2$$

and

$$l^2 = 2y^2 \left(1 + \cos \frac{2\pi}{5}\right) = 4y^2 \cos^2 \frac{\pi}{5}.$$

Therefore

$$\begin{aligned} A_5(x) &= 5 \left(\frac{x}{2} + \frac{r'l}{2} \right) \\ &= \frac{5}{2} \left(x + y \cos \frac{\pi}{5} \sqrt{4 + x^2 - 4y^2 \cos^2 \frac{\pi}{5}} \right) \\ &= \frac{5}{2} \left(x + \left(\sin \frac{\pi}{5} - \frac{x}{2} \cos \frac{\pi}{5} \right) \sqrt{x^2 \sin^2 \frac{\pi}{5} + 2x \sin \frac{2\pi}{5} + 4 \cos^2 \frac{\pi}{5}} \right) \end{aligned}$$

and

$$\begin{aligned} P_5(x) &= 5(x + l) \\ &= 5 \left(x + 2y \cos \frac{\pi}{5} \right) \\ &= 5 \left(x \left(1 - \cos \frac{\pi}{5} \right) + 2 \sin \frac{\pi}{5} \right). \quad (23) \end{aligned}$$

In this case the perimeter formula is much simpler. If we denote the ratio y/x by λ then we can derive a formula for the perimeter in terms of λ , which we will designate as $p_5(\lambda)$: From formula (22) we have

$$x = \frac{2 \tan \frac{\pi}{5}}{1 + 2\lambda}.$$

If we substitute this in formula (23) we obtain

$$\begin{aligned} p_5(\lambda) &= 5 \left(\frac{2 \tan \frac{\pi}{5}}{1 + 2\lambda} \left(1 - \cos \frac{\pi}{5} \right) + 2 \sin \frac{\pi}{5} \right) \\ &= \frac{5}{1 + 2\lambda} \left(2 \tan \frac{\pi}{5} + 4\lambda \sin \frac{\pi}{5} \right). \quad (24) \end{aligned}$$

The corresponding approximation to π for any choice of λ is

$$\pi \approx \frac{p_5(\lambda)}{2} = \frac{5}{1 + 2\lambda} \left(\tan \frac{\pi}{5} + 2\lambda \sin \frac{\pi}{5} \right) \quad (25)$$

For example, if $\lambda = 6/5$ then the approximation to π is 3.14298

An identical formula with “5” replaced by “n” can be used if the

surrounding pentagon is replaced by any regular polygon with an unspecified number of sides (n), i.e. formula (24) generalizes to

$$p_n(\lambda) = \frac{n}{(1+2\lambda)} \left(2 \tan \frac{\pi}{n} + 4\lambda \sin \frac{\pi}{n} \right) \quad (26)$$

and formula (25) generalizes to

$$\pi \approx \frac{p_n(\lambda)}{2} = \frac{n}{(1+2\lambda)} \left(\tan \frac{\pi}{n} + 2\lambda \sin \frac{\pi}{n} \right). \quad (27)$$

Application to the Lunn–Heisenberg Constant

We will now apply formulas (20), (21), and (27) in order to modify the Lunn–Heisenberg constant. For convenience, we will denote the right-hand side of formula (20) by π_n^c (“c” for circumscribed), the right-hand side of formula (21) by π_n^e (“e” for equalizing), and the right-hand side of formula (27) by $\pi_{\lambda,n}^a$ (“a” for Ahmes), i.e.

$$\pi_n^c = n \tan (\pi/n) \quad (28)$$

$$\pi_n^e = \frac{n \sin (\pi/n)}{\sqrt{\frac{n \sin (2\pi/n)}{2\pi}}} \quad (29)$$

$$\pi_{\lambda,n}^a = \frac{p_n(\lambda)}{2} = \frac{n}{(1+2\lambda)} \left(\tan \frac{\pi}{n} + 2\lambda \sin \frac{\pi}{n} \right). \quad (30)$$

Because formula (6) determines an approximation to α that is too small, we replace π by π_n^c according to formula (28) for different choices of n in order to obtain a larger value. Table 1 shows the value of $\frac{\pi_n^c}{2 \cdot 6^3}$ correct to eight decimal positions for a few values of n .

The best approximation to the fine structure constant occurs for $n=31$. For values of n less than 31 the ratio $\frac{\pi_n^c}{2 \cdot 6^3}$ is too big, and for values of n larger than 31 it is too small. Therefore

$$\alpha \approx \frac{\pi_{31}^c}{2 \cdot 6^3} = \frac{31 \tan (\pi/31)}{432} = 0.007297203437 \quad (31)$$

According to formula (2) this differs from the correct value of α by 1 unit in the 5th significant digit. A 31-sided regular polygon is called a *triacontakai-henagon*.

TABLE 1
The Best Area Equalizing Polygon
for $n = 29-33$

n	$\pi_n^c / (2 \times 6^3)$
29	0.00730079
30	0.00729891
31	0.00729720
32	0.00729566
33	0.00729425

TABLE 2
The Best Area Equalizing Polygon
for $n = 20-24$

n	$\pi_n^e / (2 \times 6^3)$
20	0.00730235
21	0.00729952
22	0.00729708
23	0.00729495
24	0.00729309

Similarly, we can replace π in formula (6) by π_n^e according to formula (29) for different choices of n . Table 2 shows the value of $\frac{\pi_n^e}{2 \cdot 6^3}$ correct to eight decimal positions for a few values of n .

The best approximation to the fine structure constant occurs for $n = 22$. For values of n less than 22 the ratio $\frac{\pi_n^e}{2 \cdot 6^3}$ is too big and for value of n larger than 22 it is too small. Therefore,

$$\alpha \approx \frac{\pi_{22}^e}{2 \cdot 6^3} = \frac{11 \sin(\pi/22)}{216 \sqrt{\frac{11 \sin(\pi/11)}{\pi}}} = 0.007297081436 \dots \quad (32)$$

According to formula (2) this differs from the correct value of α by three units in the 5th significant digit. A 22-sided regular polygon is called an *icosikaidigon*.

The replacement of π in formula (6) by $\pi_{\lambda,n}^\alpha$ according to formula (30) for different choices of n is more complicated because of the additional parameter λ . In fact, it is possible (for each fixed value of n) to find (numerically) the value of λ that is the solution of the equation

$$\frac{\pi_{\lambda,n}^\alpha}{2 \cdot 6^3} = 0.0072973525664. \quad (33)$$

In other words, it is possible (for each fixed value of n) to adjust the numerator of the fraction on the left-hand side of the equation above

TABLE 3
Solving for λ in Formula (33) for Different Values of n

n	λ	ratio	n	λ	ratio
3	1.8432	540/293	17	0.44219	241/545
4	1.3078	310/237	18	0.39996	2/5
5	1.1245	930/827	19	0.35937	216/601
6	1.0221	325/318	20	0.32045	9000/28081
7	0.94806	50000/52737	21	0.28323	177/625
8	0.88611	459/518	22	0.24771	8000/32297
9	0.82986	40000/48201	23	0.21386	179/837
10	0.77658	608/783	24	0.18166	2800/1541
11	0.72507	12500/17239	25	0.15106	16000/10589
12	0.67485	687/1018	26	0.12202	3000/2459
13	0.62579	20000/31959	27	0.094472	41/434
14	0.57789	523/905	28	0.068363	2500/36571
15	0.53125	332/625	29	0.043628	25/573
16	0.48598	434/893	30	0.020200	2000/99009

in order to produce a ratio that equals the currently accepted measured value of the fine structure constant. The question is whether there is something interesting about the value of λ obtained in this way (for each n). This question will be answered with reference to Table 3 where, for each value of n , the value of λ which solves formula (33) is given with an accuracy of five significant digits. The *inverse symbolic calculator* which is available at the website (Singer et al., 2018) was employed to find the corresponding fraction in the third column which matches this value of λ with an accuracy of at least four significant digits.

Recall that n determines the number of sides of the regular polygon that circumscribes the circle and λ is the ratio according to which a semi-regular polygon with double the number of sides is created in order to approximate the circle more accurately. The table stops at $n = 30$ because for larger values of n there is no solution for λ that is a positive number.

The value of n which is very interesting and surprising is $n = 18$ because the corresponding value of λ is the simple ratio $2/5$. The corresponding semi-regular polygon has 36 sides and it can be identified by any of the ratios $y/x = 2/5$, $(2y)/x = 4/5$, $(2y + x)/x = 9/5$ or their reciprocals. Formula (7) is thus a consequence of setting $n = 18$ and $\lambda = \frac{2}{5}$ in formula (30) in order to obtain the expression for $\pi_{2/5,18}^\alpha$ that replaces π in formula (6). We note that

$$\pi_{2/5,18}^\alpha = 3.15245522842 \dots \quad (34)$$

By means of the following properties of trigonometric ratios

$$\begin{aligned} 4 \sin \frac{\pi}{18} + 5 \tan \frac{\pi}{18} &= \tan \frac{\pi}{18} \left(4 \cos \frac{\pi}{18} + 5 \right) \\ &= \frac{1}{\sqrt{3}} \left(1 - 4 \sin \frac{\pi}{18} \right) \left(4 \cos \frac{\pi}{18} + 5 \right) \\ &= \frac{1}{\sqrt{3}} \left(1 - 8 \cos \frac{\pi}{36} \sin \frac{\pi}{36} \right) \left(1 + 8 \cos^2 \frac{\pi}{36} \right) \end{aligned}$$

(the second step above is explained in the Appendix), we obtain the following alternative formulation of formula (7) which is perhaps more pleasing and involves the angle $\pi/36$.⁹

$$\alpha \approx \frac{1}{6^3} \frac{\left(1 - 8 \cos \left(\frac{\pi}{36} \right) \sin \left(\frac{\pi}{36} \right) \right) \left(1 + \cos^2 \left(\frac{\pi}{36} \right) \right)}{\sqrt{3}} = 0.0072973500657 \quad (35)$$

In summary, we have that

- among circumscribed polygons (or perimeter-equalizing polygons), a 31-sided regular polygon produces the best approximation to the value of the fine structure constant by means of formula (31).
- among area-equalizing polygons, a 22-sided regular polygon produces the best approximation to the value of the fine structure constant by means of formula (32).
- among semi-regular polygons the simplest construction that accurately approximates the fine structure constant (by means of formula (35)) is a 36-sided semi-regular polygon with a 2:5 ratio.

We remark that there is a surprising connection between the numbers 22 and 31, which is that 22 is the fourth *pentagonal number* (defined by the formula $n(3n - 1) / 2$), and 31 is the fourth *centered pentagonal number* (defined by the formula $\frac{5n^2 - 5n + 2}{2}$).

THE WORLD CLOCK DREAM REVISITED

We will now point out some interesting similarities between formula (7) and its Pythagorean geometric derivation involving a 36-sided semi-regular polygon and formulas (13) and (14). We will also interpret the occurrence of the numbers 4, 5, 6, and 8 in formulas (7) and (35) in the context of the World Clock Dream.

As briefly mentioned earlier, the formulas (13) and (14) are interpreted by Vr laki and Ndai (2008) and Vr laki and Rudas (2009) in terms of *unconscious creative background processes* (as exemplified by the dreams of Wolfgang Pauli) and *number archetypes* or *archetypal patterns and images*. The number π is a geometric number. The number 3 arises from the three temporal rhythms in Pauli's World Clock Dream and manifests in formula (13) as π , π^2 , and π^3 . The number 4 arises from four figures representing the four cardinal directions in the dream (and some of his other dreams) and manifests as the coefficient of π^3 in formula (13).

In formula (7) the number 4 also manifests as a coefficient. The three temporal rhythms manifest as 6^2 and 6^3 in formulas (7) and (35).

The number 5 is another coefficient in formula (7). It arises in the World Clock Dream as the sum of the four little men and the black bird.

The number 8, which is a coefficient in formula (35), is represented in the World Clock dream by the four little men, each carrying a pendulum. A pendulum indicates multiplication by 2. Thus $4 \times 2 = 8$.

Furthermore, the *twin property* which manifests in formula (14) in the corrective term $\frac{\delta_x}{1-\delta_x} \frac{\delta_x}{1+\delta_x}$ with $\delta_x = \frac{\pi}{360}$ corresponding to the two

disks that are orthogonal to each other, also manifests in formula (7) in the two trigonometric terms (sine and tangent), which are defined as the ratios of the sides of a right triangle.

In Pauli's dreams the numbers 32 and 36 are interchangeable because the Swedish physicist, Johannes Rydberg, who discovered the

formula $2p^2$ (that fascinated Pauli) for the number of elements in each period of the Periodic Table, had initially assumed that there were 36 elements, not 32, in the period containing the rare earths (lanthanides) (Vrlaki & N. dai, 2008, pp. 91ñ93). If there are 36 instead of 32 equal segments of the horizontal and vertical disks in the World Clock Dream, then the angle of each segment is $\frac{2\pi}{36} = \frac{\pi}{18}$ radians (or 10), the angle used in formula (7).

Finally, we mention that if the value $x = 360$ in formula (14) is replaced by $x = 392$, i.e. $\delta_x = \frac{2\pi}{392}$, then the left-hand side evaluates to 137.036046796, which is very close to the value for α^{-1} in formula (8). This is surprising in view of the fact that if $x = 32$, i.e. $\delta_x = \frac{2\pi}{32}$, then the left-hand side of formula (14) evaluates to 136.996, which is very close to 137 (as pointed out by Vrlaki & Rudas, 2009).

NUMBER 7

As mentioned above, the number 7 is connected with the black bird as the anima in the World Clock Dream. To the classical Greeks, 7 was the “virgin number” because among the first ten counting numbers it is the only one that is neither a multiple nor a factor of any of the others (Starbird, 2003, p. 22). In an ancient diagram known as “the seed of life” six intersecting circles representing all of physical creation are united in spiritual wholeness by a seventh circle passing through their centers (Starbird, 2003, pp. 26ñ77). In general, the number 7 is associated with eternity, perfection, and completion (in the spiritual sense) (Starbird, 2003, p. 47).

A natural formula to consider is $137 + 7 = 144 = 12^2$. The number 144 is the 12th (non-zero) Fibonacci number. It is associated with fullness or completeness on the Earthly or physical plane. A discussion about the numbers 7 and 12 can be found in Starbird (2003, pp. 48ñ49). It is also mentioned by Gaunt (2000, p. 144) that the Hebrew word *kedem*, which is translated as “beginning”, “eternal”, “origin”, or “everlasting”, has a numerical value of 144.

A surprising connection between the numbers 24 and 70 is the identity

$$1^2 + 2^2 + 3^2 + \dots + 23^2 + 24^2 = 70^2$$

(i.e. the sum of the first 24 perfect squares is the perfect square 70^2 .) This identity is special because 24 is the only natural number k (besides the trivial case $k = 1$) in the formula

$$1^2 + 2^2 + 3^2 + \dots + (k-1)^2 + k^2 = p^2$$

for which the solution p is a natural number. The physicist and string theorist John Baez explains, in a video on his website about his three favorite numbers (Baez, 2008), why this identity is the reason string theory works best in 26 dimensions. His three favorite numbers are 5, 8, and 24. John Michell (2008, p. 65) speculates that the words *pnuema* (breath) and *eagle* may have been adopted as religious terms for Spirit because they both have a gematria of $576 = 24^2$ in their Greek spelling. He goes on to mention that the importance of 24 is that it can be expressed as $8 + 8 + 8$, and 888 is the gematria of Jesus.

LIGHT, ELECTRIC CHARGE, AND PLANCK'S CONSTANT

It is possible to speculate about the symbolic meaning of the numbers 108, 24, and 5 in the sum $5 + 24 + 108 = 137$. As mentioned above, the number 24 signifies Spirit, which is associated with light. The number 108, as the symbol for the Sacred Feminine, is also associated with the Earth and negative charge (Michell, 2008, p. 205). The basic unit of negative charge is the charge of an electron. Finally, it is a curious fact that in astrology the glyph for Saturn resembles number 5, and also resembles the symbol for Planck's constant. An interesting commentary about this is posted on the Facebook page of the Esoteric Science Institute (Poirier, 2017). Therefore, we have a remarkable correspondence between the numbers 108, 24, and 5 and the quantities e , c , and h , respectively, which combine to define the fine structure constant.

CONCLUSION

With our investigation of the Lunn̄Heisenberg constant we have expanded on certain speculations of a connection between the fine structure constant and mysticism (especially Pythagorean mysticism and Kabbalah). We have given a new and broader context to the

methodology of Vr Iaki et al. in their interpretation of Pauli's World Clock Dream and other dreams. Furthermore, the number 137 also has a surprising connection to the repeating sequence of digital roots of the Fibonacci numbers via the formula $137 = 345_6 = 108 + 24 + 5$.

In summary:

1. Certain numbers important in mathematics and science, for example 137 and 108, are also important in mysticism and world religions.
2. Certain numbers, features, and patterns in the formulas (or derivation of the formulas) that approximate the fine structure constant or calculate the number 137 correspond to numbers and structures in Pauli's World Clock Dream.
3. The small counting numbers are the archetypes of order; in particular 5 manifesting as Pythagorean geometry and 6 manifesting as Pythagorean arithmetic.

This gives credence to Jung's proposal of an *unus mundus* or underlying mathematical reality unifying science and mystical experience.

ACKNOWLEDGMENTS

This research was inspired by Dr. Joseph P. Farrell's webinar on the fine structure constant on his website <http://www.gizadeathstar.com>. It was in this webinar that I learned about the *Flash Forward* TV series and novel mentioned in note 3 and some other interesting facts about the fine structure constant. I also wish to acknowledge my friends Maggie Fuller and Sidney Steffens from Galveston, Texas. Maggie told me about *Magdalene's Lost Legacy* by Margaret Starbird, which was an important reference for this article, and it was Sid's enthusiasm for the number π that led me to think about the LunnñHeisenberg constant. It would be remiss of me not to thank my department head, JoAnn DiGeorgio-Lutz, for giving me a teaching reduction in the Fall semester of 2016 that gave me the time to do this research. Finally, I thank the referees for their references, comments, and suggestions, in response to which I included note 1 on fundamental constants, the paragraph on the g-factor and the anomalous magnetic moment of the electron, the reference to the article by Peres in *Physics Today*, and Bill Harrington's approximation for α^{-1} .

APPENDIX

The formula

$$\tan \frac{\pi}{18} = \frac{1}{\sqrt{3}} = \left(1 - 4 \sin \frac{\pi}{18}\right) \quad (36)$$

can be proved using the triple angle identities

$$\sin(3\theta) = 3 \sin(\theta) - 4 \sin^3(\theta)$$

$$\cos(3\theta) = 4 \cos^3(\theta) - 3 \cos(\theta)$$

$$\tan(3\theta) = \frac{3 \tan(\theta) - \tan^3(\theta)}{1 - 3 \tan^2(\theta)}$$

and solving cubic equations; however, the following elegant proof was discovered by the author's student Paxton Martin.

In a 30° - 60° right triangle with a hypotenuse of length 2 and sides opposite 30° and 60° having lengths 1 and $\sqrt{3}$, respectively, insert a line segment that trisects the 30° angle and divides the opposite side into lengths labeled x and y , as shown in Figure 5.

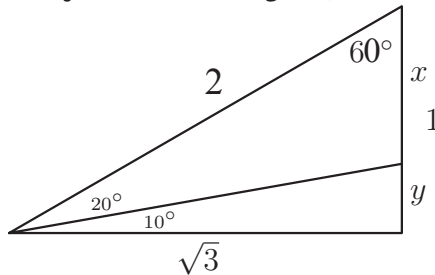


Figure 5.

From the *sine rule* for triangles, it follows that

$$\frac{x}{\sin(20^\circ)} = \frac{2}{\sin(100^\circ)}$$

Because $\sin(100^\circ) = \cos(10^\circ)$ and $\sin(20^\circ) = 2 \sin(10^\circ) \cos(10^\circ)$ (by an application of the *double angle identity* for the sine ratio), we find that $x = 4 \sin(10^\circ)$. It follows that $y = 1 - 4 \sin(10^\circ)$, and therefore

$$\tan 10^\circ = \frac{1}{\sqrt{3}} (1 - 4 \sin 10^\circ),$$

which is formula (36) if the angles are expressed in radian measure.

NOTES

¹ There are roughly two dozen fundamental physical constants, the majority of which concern the masses of fundamental particles (quarks, leptons, force mediating bosons), and additional constants that also appear as brute facts about Nature that defy deeper explanation including c (the speed of light), G (the universal gravitational constant), e (the charge of the electron), and α (the fine structure constant), which is the topic of this paper.

² Using cgs units; in SI units this is expressed as

$$\frac{1}{4\pi \epsilon_0} \frac{e^2}{\hbar c}$$

where ϵ_0 is the electric constant or permittivity of free space.

³ For example, in the 2009 TV series *Flash Forward* (based on the novel of the same title by the Canadian author Robert J. Sawyer in 1999) the entire human population of the planet blacks out for exactly 2 minutes and 17 seconds (a total of 137 seconds) due to a particle accelerator coming online for the first time.

⁴ If angles are measured in degrees instead of radians, then

$$\alpha \approx \frac{1}{6^3} (4 \sin(10^\circ) + 5 \tan(10^\circ))$$

⁵ This can be obtained using the online base converter (Gang, 1998).

⁶ The primary polyhedron with pentagonal faces is the regular *dodecahedron*, which is one of the five *Platonic solids*. It has twelve pentagonal faces. In Luminet et al. (2003) and Weeks (2004), a geometrical model for the universe as a *Poincaré dodecahedral space* is presented based on observations of weak wide-angle temperature correlations in the cosmic microwave background. Poincaré dodecahedral space is a *non-simply connected 3-manifold* formed by “glueing” together the opposite faces of a dodecahedron.

⁷ The actual values are close to 107.5 and 110.6, respectively.

⁸ The Babylonians approximated the ratio of the perimeter of a regular

hexagon to the circumference of the circumscribed circle by $\frac{24}{25}$. It is not known how they obtained this fraction, which results in $\pi \approx 3.125$ (see Beckman, 1971, pp. 121–13, 211–22).

⁹ With angles expressed in degrees rather than radians, formula (35) is

$$\alpha \approx \frac{1}{6^3} \frac{(1 - 8 \cos(5^\circ) \sin(5^\circ)) (1 + 8 \cos^2(5^\circ))}{\sqrt{3}}$$

REFERENCES

- Afshordi, N., & Magueijo, J. (2016, November 18). The critical geometry of a thermal big bang. *Physical Review D*, 94. <https://doi.org/10.1103/PhysRevD.94.101301>
- Baez, J. (2008). My favorite numbers. <http://math.ucr.edu/home/baez/numbers/>
- Barrow, J. D. (1999, January). Cosmologies with varying light speed. *Physical Review D*, 59, 043515. <https://doi.org/10.1103/PhysRevD.59.043515>
- Barton, G. A. (1908). On the Babylonian origin of Plato's nuptial number. *Journal of the American Oriental Society*, 29, 210–219.
- Beckman, P. (1971). *A history of pi*. Golem Press.
- Bogomolny, A. (1996). Golden ratio in regular pentagon. Cut-The-Knot website. https://www.cut-the-knot.org/do_you_know/GoldenRatioInRegularPentagon.shtml
- Bohm, D. (1980). *Wholeness and the implicate order*. Routledge.
- Bohr, N. (1913). On the series spectrum of hydrogen and the structure of the atom. *Philosophical Magazine Series 6*, 26, 332–335.
- Born, M. (1935). The mysterious number 137. *Proceedings of the Indian Academy of Sciences A*, 2, 533–561.
- Brown, P. (2016). *Foundations of mathematics: Algebra, geometry, trigonometry and calculus*. Mercury Learning and Information.
- Campbell, D. T. (1974). Evolutionary epistemology. In P. A. Schilpp (Ed.), *The philosophy of Karl Popper* (pp. 413–463). Open Court.
- Consa, O. (2018). Helical solenoid model of the electron. *Progress in Physics*, 14(2), 80–89.
- Cowie, L. L., & Songaila, A. (1995). Astrophysical limits on the evolution of dimensionless physical constants over cosmological time. *Astrophysical Journal*, 453, 596–598.
- Damour, T., & Dyson, F. (1996). The Oklo bound on the time variation of the fine-structure constant revisited. *Nuclear Physics B*, 480(1), 37–54.
- Dattoli, G. (2010). The fine structure constant and numerical alchemy.
- Del Castillo-Mussot, M., & Dias, R. C. (1993). Fuzzy sets and physics. *Revista Mexicana de Fisica*, 39(2), 295–303.
- Eddington, A. S. (1929). The charge of an electron. *Proceedings of the Royal Society A*, 122(789), 358–369.

- Eddington, A. S. (1931). On the value of the cosmical constant. *Proceedings of the Royal Society A*, 133(822), 605–615.
- Elst, K. (2003). The Koenraad Elst site.
<http://koenraadelt.bharatvani.org/articles/misc/why1o8.html>
- Feynman, R. P. (1988). *The strange theory of light and matter*. Princeton University Press.
- Gang, X. (1998). Base converter.
http://wims.unice.fr/wims/en_tool-number-baseconv.en.html
- Gaunt, B. (2000). *The bible's awesome number code!* Adventures Unlimited Press.
- Gellman, J. (2014). Mysticism. *Stanford Encyclopedia of Philosophy*.
<http://plato.stanford.edu/entries/mysticism/>
- Gilson, J. G. (1996). Calculating the fine-structure constant. *Physics Essays*, 9(2), 342–353.
- Gilson, J. G. (1997). Relativistic wave packing and quantization. *Speculations in Science and Technology*, 20, 21–31.
- Gilson, J. G. (2012). The fine structure constant, a 20th century mystery.
- Gorelik, I. (2009). Fine structure constant collection. OoCities.
<http://www.oocities.org/igorelik/fine.html>
- Haas, A. E. (1924). *Atomtheorie in elementare darstellung*. Walther de Gruyter.
- Heisenberg, W. (1934). Bemerkung zur Dirac'schen Theorie des Positrons. *Zeitschrift für Physik*, 90, 209–231.
- Jordan, P. (1937). Die physikalischen Weltkonstanten. *Die Naturwissenschaften*, 25(25), 513–517.
- Jung, C. G. (1964). *Man and his symbols*. Doubleday.
- Keppler, J., Aiton, E. J., Duncan, A. M., & Field, J. V. (1997). *The harmony of the world* (volume 209). American Philosophical Society.
- Kinoshita, T. (1996). The fine structure constant. *Reports on Progress in Physics*, 59(11), 1459–1492.
- Kinoshita, T. (1997). Fine-structure constant obtained from an improved calculation of the electron $g-2$. *IEEE transactions on instrumentation and measurement*, 46(2), 108–111.
- Koole, W. (1986). *The tao of physics*. IKON TV in association with BBC TV.
<https://www.youtube.com/watch?v=kBJFJVZMnlo>
- Krag, H. (2003). A partial history of the fine structure constant. *Archive for History of Exact Sciences*, 57, 395–431.
- Lanzi, O. (2017). Possible all-pentagon polyhedra. Mathematics Stack Exchange.
<http://math.stackexchange.com/questions/1609854/possible-all-pentagon-polyhedra>
- Leeds, M. (2013). Phi, Metatron's cube and the holy number 108. *World-Mysteries*.
<http://blog.world-mysteries.com/science/phi-metatrons-cube-and-the-holy-number-108/>

- Lewis, G. N., & Adams, E. Q. (1914). A theory of ultimate rational units; numerical relations between elementary charge, workings quantum, constant of stefan's law. *Physical Review*, 3, 92ñ102.
- Lewis, H. S. (1979). *Rosicrucian questions and answers: With complete history of the Rosicrucian Order* (volume 1). Supreme Grand Lodge of AMORC.
- Luminet, J.-P., Jeffrey R. Weeks, J. R., Riazuelo, A., Lehoucq, R., & Uzan, J.-P. (2003). Dodecahedral space topology as an explanation for weak wide-angle temperature correlations in the cosmic microwave background. *Nature*, 425(6958), 593ñ595.
- Lunn, A. C. (1922). Atomic constants and dimensional invariants. *Physical Review*, 20, 1ñ14.
- Madore, J. (1992). The fuzzy sphere. *Classical and Quantum Gravity*, 9(1), 69ñ87.
- Michell, J. (2008). *The dimensions of paradise: Sacred geometry, ancient science, and the heavenly order on Earth*. Simon and Schuster.
- Miller, A. I. (2009). *137, Jung, Pauli, and the pursuit of a scientific obsession*. W. W. Norton.
- Myers, E. G. (2019). High-precision atomic mass measurements for fundamental constants. *Atoms*, 7(1), 37.
- Olsen, S. (2006). *The golden section: Nature s greatest secret*. Bloomsbury Publishing.
- Onstott, S. (2019). Why 137? *Secrets in Plain Sight*.
<http://www.secretsinplainsight.com/why-137/>
- Peres, A. (1971). A new pastimeC alculating alpha to one part in a million. *Physics Today*, 24(11), 9.
- Poirier, J. J. (2017). Astrological correspondences in quantum mechanics. Esoteric Science Institute.
<https://www.facebook.com/esotericscienceinstitute/posts/1250782138376494:0>
- Rice, J. (1925). On Eddington's natural unit of the field, and possible relations between it and the universal constants of physics. *Philosophical Magazine Series* 6, 49(290), 457ñ463.
- RobertLovesPi. (2015). A polyhedron with 36 pentagonal faces.
<https://robertlovespi.net/2015/12/16/a-polyhedron-with-36-pentagonal-faces>
- RobertLovesPi. (2016). Three polyhedra with only pentagonal faces.
<https://robertlovespi.net/2016/08/02/two-polyhedra-with-only-pentagonal-faces>
- Robertson, R. (1995). *Jungian archetypes: Jung, Gödel, and the history of archetypes*. Nicolas-Hays.
- Savedoff, M. P. (1956). Physical constants in extra-galactic nebulae. *Nature*, 178, 688ñ689.
- Scholem, G. (1990). *Origins of the Kabbalah*. Princeton University Press.
- Schönfeld, E., & Wilde, P. (2008). Electron and fine structure constant II. *Metrologia*, 45(3), 342ñ355.
- Schönfeld, E., & Wilde, P. (2012). A new theoretical derivation of the fine structure constant. *Progress in Physics*, 1, 3ñ5.
- Sherbon, M. A. (2008). Constants of nature from the dynamics of time.

- Sherbon, M.A. (2014). Fundamental nature of the fine-structure constant. *International Journal of Physical Research*, 2(1), 1ñ9.
- Singer, N., Shouldice, A., Ye, L., Daske, T., Dobcsanyi, P., Manna, D., Chan, O.-Y., & Borwein, J. (1915). Inverse symbolic calculator. University of Newcastle, New South Wales. <https://isc.carma.newcastle.edu.au/>
- Sommerfeld, A. (1915). *Die feinstruktur der Wasserstoff und der Wasserstoffähnlichen Linien* (pp. 459ñ500). Akademie der Wissenschaften.
- Sommerfeld, A. (1916). Zur quantentheorie der spektrallinien. *Annalen der Physik*, 51, 1ñ94.
- Sperry, R. W. (1987). Structure and significance of the consciousness revolution. *The Journal of Mind and Behavior*, 8, 7ñ65.
- Stanbury, P. (1983). The alleged ubiquity of π . *Nature*, 304(5921), 11.
- Starbird, M. (2003). *Magdalene's lost legacy: Symbolic numbers and the sacred union in Christianity*. Bear & Co.
- Várlaki, P., & Nádai, L. (2008). Number archetypes and 'background' control theory concerning the fine structure constant. *Acta Polytechnica Hungarica*, 5(2), 71ñ104.
- Várlaki, P., & Rudas, I. J. (2009). Twin concept of fine structure constant as the 'self number-archetype' in perspective of the PauliñJung correspondence. *Acta Polytechnica Hungarica*, 6(22), 77ñ108.
- Várlaki, P., Nádai, L., Bokor, J., & Rövid, A. (2009a). Controllingñobserving interpretation of the fine structure constant. In *Proceedings of the IEEE 13th International Conference on Intelligent Engineering Systems* (pp. 61ñ71. IEEE Press.
- Várlaki, P., Rudas, I. J., & Fuller, R. (2009b). Fine structure constant – A possibilistic approach. In J. Fodor J. & J. Kacprzyk (Eds.). (2009b). *Towards Intelligent Engineering and Information Technology*, 243 of *Studies in Computational Intelligence*, pages 665ñ679. Springer.
- Webb, J. K., Flambaum, V. V., Churchill, C. W., Drinkwater, M. J., & Barrow, J. D. (1998). Time variation of the fine structure constant. *Physical Review Letters*, 82(5), 884ñ887.
- Webb, J. K., Murphy, M. T., Flambaum, V. V., Dzuba, V. A., Churchill, C. W., Barrow, J. D., Prochasta, J. X., & Wolfe A. M. (2001, August). Further evidence for cosmological evolution of the fine structure constant. *Physical Review Letters*, 87, 091301.
- Webb, J. K., King, J. A., Murphy, M. T., Flambaum, V. V., Carswell, R. F., Bainbridge, M. B., Wilczynska, M. R., & Koch, F. E. (2012). Spatial variation in the fine-structure constant – New results from VLT/UVES. *Monthly Notices of the Royal Astronomical Society*, 422, 3370ñ3414.
- Weeks, J. (2004). The Poincaré dodecahedral space and the mystery of the missing fluctuations. *Notices of the AMS*, 51(6), 610ñ619.
- Weisstein, E. W. (1999). Pentagonal hexecontahedron. Wolfram Math-World. <http://mathworld.wolfram.com/PentagonalHexecontahedron.html>

Wikipedia. (n.d.). Casting out nines.

https://en.wikipedia.org/wiki/Casting_out_nines

Wikipedia. (2016). Digital root. https://en.wikipedia.org/wiki/Digital_root

Wikipedia. (2017). 108 (number). [https://en.wikipedia.org/wiki/108_\(number\)](https://en.wikipedia.org/wiki/108_(number))

Wikipedia. (2018). Pythagorean triple. https://en.wikipedia.org/wiki/Pythagorean_triple

Wisniewsky, M. Y. (1993). 72 Names of G-d. http://www.chabad.org/kabbalah/article_cdo/aid/1388270/jewish/72-Names-of-G-d.htm

RESEARCH ARTICLE

Psychedelic Telepathy: An Interview Study

PETTER GRAHL JOHNSTAD

University of Bergen, Norway

Submitted June 18, 2019; Accepted February 13, 2020; Published September 15, 2020

<https://doi.org/10.31275/20201747>

Creative Commons License CC-BY-NC

Abstract This article presents an interview study of ostensible telepathy experiences induced by psychedelic drugs, with the aim of broadening our understanding of the nature and characteristics of such experiences. Of 40 anonymous psychedelics users interviewed about their experiences, 16 reported some form of psychedelic telepathy. Respondents were recruited at various online fora for individual interviews via private messaging. They reported three main types of telepathic communication: 1) an information-exchange type of telepathy that often enabled people to communicate in images as well as in words; 2) a state sometimes referred to as telempathy that allowed for the direct exchange of feeling-states; and 3) a state of self-dissolution and telepathic unity where one could not differentiate one's own thoughts and feelings from those of the friend or partner. Some participants complained about the lack of privacy especially in the more intense forms of telepathic states, and were hesitant to repeat the experience, while others claimed they had become accustomed to such states and experienced them regularly. The article concludes that further studies are warranted, and suggests a strategy for an experimental study of psychedelic telepathy.

Keywords: psychedelic; interview; qualitative; telepathy; self-dissolution

INTRODUCTION

The term telepathy was coined by the early psychical researcher Frederic W. H. Myers from the Greek *τῆλε* (*tele*), meaning distant, and *πάθος* (*pathos*), which in this context means feeling or experience.

Myers defined his neologism as “the communication of impressions of any kind from one mind to another, independently of the recognized channels of sense” (1896–1897, p. 174). Psychedelics for their part are a group of drugs named by psychiatrist Humphry Osmond after the Greek *ψυχή* (*psyche*), meaning soul or mind, and *δηλεῖν* (*delein*), to reveal or manifest, and are known for their powerful effects on feelings, thoughts, and perceptions (Nichols, 2004, 2016). The classical serotonergic psychedelics include mescaline (the active constituent of peyote), psilocybin (the active constituent of “magic mushrooms”), lysergic acid diethylamide (LSD), and N,N-dimethyltryptamine (DMT).

Telepathic communication between research subjects in experimental settings is documented in parapsychological literature, although this literature has not found much acceptance in the mainstream academic world. In the past decades, most telepathy research has taken the form of so-called *ganzfeld* (a German word meaning ‘total field’) studies, where research subjects are flooded with unpatterned sensory stimuli in order to achieve an effect analogous to sensory deprivation (Cardea, 2018). The state of mind that results from *ganzfeld* stimuli has been found particularly conducive to telepathic receptivity, and the most recent and comprehensive meta-analyses of such studies found support for a telepathic effect (Storm et al., 2010; Williams, 2011), although skeptics have challenged these findings (Alcock, 2010; Hyman, 2010).

These *ganzfeld* studies indicate that an altered state of consciousness may be supportive of telepathic receptivity, and perhaps of paranormal experiences in general. As psychedelics are known for inducing powerful alterations in consciousness, with effects that include increases in mental imagery, empathy, alertness, awareness, attention, spontaneity, suggestibility, openness, intuitive thinking, and emotional flexibility (see review in Luke, 2012), there is reason to believe that the psychedelic state could be conducive of telepathic experience. Neuropharmacological research has demonstrated that, perhaps counterintuitively, these psychedelics-induced alterations in consciousness correlate with general decreases in brain activity (Carhart-Harris et al., 2012), while also increasing the number of long-range cortical connections (Petri et al., 2014). Thus, a human brain affected by classical psychedelics will be both relatively quieter and more integrated,

with an increase in topologically long-range functional connections. Carhart-Harris et al. regarded their finding of a psilocybin-induced decrease in overall brain activity as being consistent with the reducing-valve model of the brain that Aldous Huxley (1954/1994) developed on the basis of Henri Bergson's work (1896/1990), which posits that the brain has an active filtering mechanism constraining our experience of the world to that which has value for immediate survival. The observed reduction in brain activity during psychedelic influence may therefore involve a reduction also in filtering activity, enabling a state of unconstrained cognition that is perhaps beneficial for experiences of telepathy and other psi phenomena.

In support of the view that psychedelics could be beneficial for telepathy, there is a substantial anthropological literature on indigenous psychedelics use resulting in ostensible psi phenomena (Luke, 2010), as well as a number of surveys on psi experiences among modern psychedelics users. One review of surveys of paranormal experience in relation to psychedelics use found that "of those reporting the use of psychedelics, between 18 and 83 percent reported ESP experiences most commonly telepathy but also precognition actually occurring during drug use, with heavier users reporting more experiences" (Luke, 2015, p. 156). On a more anecdotal basis, an Internet search will obtain a number of trip reports from modern psychedelics users describing telepathic experiences as one of the effects of psychedelics use.

Despite this promising foundation, parapsychologists have not been very successful in demonstrating telepathy and other psi phenomena with psychedelics under controlled conditions (see overview in Luke, 2012). Most of this research took place in the psychedelic pre-prohibition era, but when parapsychologists picked up this line of research during the 1990s findings remained generally unconvincing (Bierman, 1998; Don et al., 1996; Tinoco, 1994; Wezelman & Bierman, 1997). It has been suggested that the traditional symbol-guessing procedure employed in some telepathy studies is too dull a task for psychedelics-affected participants, and that dosage may have been too low to induce telepathic effects (Luke, 2012). Furthermore, it appears that most ganzfeld studies have been set up without consideration of the sender-receiver relationship (Roe et al., 2003), although at least one study by Honorton et al. (1990) reported improved hit rates when

participants brought their own senders. Finally, Luke's (2012) review of psychedelic telepathy studies found that most such studies were set up with a sober sender together with a psychedelics-affected receiver. By contrast, the reportedly very successful psychedelic telepathy experiences discussed in this article took place between friends and partners who were simultaneously affected by (generally) high doses of psychedelics.

The purpose of this interview study of psychedelic telepathy experiences was to gain insight into how psychedelics users themselves describe the state of telepathic contact. The study aimed for a deeper understanding of the characteristics of such experiences that might allow for a tentative categorization of different types of psychedelics-induced telepathic communication. It also asked participants to describe the transition into the telepathic state, and to suggest factors that might facilitate or abet a telepathic connection. Finally, the study aimed to identify challenges or difficulties with psychedelic telepathy.

METHOD

Current or past psychedelics users were interviewed about their experiences in two phases of the study. In the first phase, 26 users of psychedelic drugs in spiritual contexts were interviewed either individually or in groups about a broad range of aspects relating to their psychedelics use. These interviews dealt with psychedelic experiences in general, and only two of the participants had a telepathic experience to report. In order to gain more insight, a second phase of the study recruited 14 users specifically on the basis of their reports of psychedelic telepathy experiences posted on Internet discussion fora. These prospective interviewees were approached with a private message stating the following:

Hello [username]! I read your post from [date] about your telepathic experience. This is interesting to me as I am starting up an academic interview study of telepathic experiences with psychedelics. Would you allow me to quote your post anonymously in my study and answer a few follow-up questions?

Follow-up questions engaged with matters such as dosage and setting, the transition into the telepathic state, whether their recollection of the experience agreed with that of their partner, and the long-term consequences of the experience, all of which were asked as open-ended questions in a non-judgmental manner. In addition, the study was informed by a number of reports posted on discussion fora by users who were either currently unreachable or who did not reply to recruitment attempts. These reports were often of considerable value to the study. In order to preserve privacy, however, only reports from authors who signed (anonymous) informed consent forms have been quoted from in this article (with ID numbers after the quotes).

Interviews were asynchronous and Internet-mediated, and participants were encouraged to interact with the interviewer via anonymized email or messaging that protected their identity from the researcher. The study was designed in conformity with Norwegian Social Science Data Services ethical guidelines. It emphasized the preservation of participant anonymity, and aimed to ensure that no participant would be identifiable either to the researcher or to readers of published material. Statements have been edited for brevity and relevance, and insignificant details have sometimes been altered to preserve anonymity. Participants were asked to read through and verify the use of their narratives. As interviews took the form of written communication, transcription was unnecessary. Data were analyzed using thematic analysis and Brinkmann and Kvale's (2015) procedure for meaning condensation, and themes were constructed in an open-ended, exploratory, and data-driven comparative analysis of participant narratives. The interview process allowed for the resolution of ambiguities through follow-up questions. No attempt was made to verify that the participants' narratives were truthful, with the one exception that interviewees were asked about how their telepathic partner later talked about the experience. This question was asked with the intent to identify non-reciprocal and possibly imagined telepathy experiences, but none of the participants indicated that there was a disagreement between themselves and their alleged telepathic partner about the nature of the experience.

Because psychedelics use is generally illegal, not all respondents were willing to provide demographic information. In order to reduce

participation stress, only a minimum of such information was requested. Of the 27 participants who provided their gender, 24 were male and three female. The median participant was in their early 30s, with an age range from 18 to late 50s. Four were married (two with children), six were in stable relationships (one with children), seven were single, and one was in the middle of a break-up. Twelve held steady jobs in retailing, education, music teaching, journalism, industrial services, IT consulting, carpentry, investment client support, and as a hospital worker, five were students, one was unemployed, and one used to work as a kindergarten assistant but was recently disabled because of an inherited condition.

RESULTS

Setting and Dosage

In all the reports available to this study, psychedelic telepathy experiences took place between friends or partners who were tripping together in the same room or area. None of the reports described experiences of telepathic contact with news presenters on television, strangers in the streets, or anyone else external to the group of trippers. With a few exceptions, the telepathy experiences were all reciprocal, involving two or more people who both felt that they were in telepathic contact with each other. Of 20 reports that mentioned which drug was taken, 15 involved LSD as the main psychedelic drug, while two involved psilocybin, two 3,4-Methylenedioxymethamphetamine (MDMA), and one d-lysergic acid amide (LSA). Doses were generally described as strong, although we should note that it is difficult to ascertain the amount of LSD in a blotter without access to a chemical lab. Nevertheless, about 300 mcg of LSD seemed to be a median dose for telepathic experiences, with a reported range from 100 mcg to 8 blotters. Some reported combining LSD with cannabis, which is often said to intensify the psychedelic effects.

Most of the reported psychedelic telepathy experiences took place with a single friend, often described as a close friend or a partner or spouse. In some reports, however, the telepathic pair was among a group of 3–5 friends, the rest of whom were not involved in the telepathic experience. A few other reports described telepathic communication

between three or more people, but none of the authors behind these reports was available for follow-up questions.

When interviews did allow for follow-up questions, I always asked whether the interviewee had talked to his or her friend about the telepathic experience, and whether this friend confirmed that it was a shared experience. With a few exceptions, everybody confirmed that they had talked about their telepathic experience over the days and weeks—sometimes for years—after it happened, and that they both agreed it was a telepathic experience. The most noteworthy exception was one interviewee who first described the experience as involving telepathy in a Reddit post, but who later changed his mind about it and now considered it an experience of communication via face reading and body language rather than telepathy. When I asked this interviewee about how the friend he shared the experience with thought about the experience today, I did not receive a reply. Another participant also failed to respond to such a question at the start of the interview, and was not heard from again.

Transition

With one exception, the telepathy experiences in this study all occurred spontaneously. The transition into the telepathic state was sometimes a noticeable event, where the trippers suddenly discovered that they could communicate telepathically, and sometimes a more gradual process that they did not recognize until it was well-established. One participant was on a heavy dose of LSD combined with cannabis, tripping with a single friend around a bonfire at an isolated cabin, and suddenly found his mind behaving in unexpected ways:

My mind started to say things that I didn't expect, things that were in my voice and had my tone quality, but were not what I was expecting myself to say. So I said to the voice: Is that you talking to me, or is that me talking to myself? And the voice said: I think you're talking to me, dude. (IDo6)

He responded with astonishment and resistance, jumping up and running away. Then he heard the sound of something like a firecracker going off:

I felt my head crack, like something gave way. The crack happened at the height of my astonishment when I ran to the other side of the bonfire to get away from my friend. It was like a pressure-release valve blowing. It seemed to be in the very center of the head, and as soon as it happened I felt different and I accepted what was happening. It was like my worldview had expanded. (IDo6)

Others described a more gradual transition. In some cases, they reported being engaged in conversations that gradually changed from vocalized to telepathic without anyone noticing. In other cases, the conversation seemed to be fully telepathic from the start, but for a while the trippers believed they were talking in the usual way:

My girlfriend and I were talking to each other. After about a 20-minute conversation, I said something out loud, and only then did I realize that during the entire conversation I hadn't ever actually said a word. To put it simply, my girlfriend was actually reading my mind and responding to my thoughts as if they were words I spoke. She noticed at the same time that I did. We were both amazed by it and ran to the living room to tell our other roommates about it. (IDo8)

A similar telepathy narrative involved two friends who were using LSD together. During the trip, one of them entered the room where the other was sitting with some friends, and the two had a long conversation. After the first one left again, it occurred to the second that they actually had not opened their mouths during this exchange. He asked the other people in the room about this, one of whom was sober, and they said that from their perspective the first person had entered the room, stood there quietly for a while, and then left again. Another interviewee described a different form of unconscious transition, where he was lying on the floor sleeping or passed out after taking 300 mcg of LSD, and then woke up in a state of telepathic contact with his friend. While all of these experiences occurred spontaneously, without any conscious intention to explore telepathy during the psychedelic trip, there was also one report of a telepathic experiment. This proto-parapsychologist

had taken MDMA and amphetamines, and suddenly felt inspired to do a little experiment in telepathy:

We sat down in a room and I said to my friend something along the lines of ‘let’s see if I can telepathically send a word’, and he was up for the experiment. Always willing to challenge my own perception of reality, I looked deep into his eyes, but rather than send a word I chose to ‘send’ a noise rather than a word, and that was a sort of nya sound. I then asked him what word I had ‘sent’ and he replied: ‘it wasn’t a word, but a sort of nya sound’. (ID27)

Other participants who had experienced telepathy sometimes tried to recreate the experience, but found that these intentional attempts to make telepathy happen failed to work. Several participants did describe having further spontaneous telepathy experiences, however, which usually took place with the same person as their first experience. Furthermore, a few reported that telepathic experiences were something they had come to expect from deep psychedelic trips. Having learnt from their first experience how to enter the telepathic state, they found it possible to repeat this maneuver in later psychedelic trips. Unfortunately, the skills involved in this task were not easily communicated. One described it as becoming aware of a subtle “sliver” that it was possible to slip through, and having once recognized this subtle mental phenomenon spontaneously, his awareness became attuned to it and this made subsequent recognition easier. On a somewhat more practical level, others recommended that trippers hoping for a telepathic experience should look deeply into one another’s eyes, which they claimed serve as a gateway into other people’s consciousness. Another participant whose intentional attempts at recreating the telepathic experience always failed, found that his three occasions of spontaneous psychedelic telepathy with the same friend had the following in common:

We were completely absorbed in something else, relaxed, distracted, and in sync. I believe a personal relationship is very helpful to the process. (IDo6)

Telepathy and Telempathy

Several different forms of telepathic contact were described by the participants in this study. In its most common form, telepathy was about a direct, two-way exchange of information. As we saw above, participants sometimes reported that they were engaged in a telepathic conversation for a long time before they noticed that they were not talking in the usual sense, and in these experiences the telepathic conversation clearly resembled an ordinary conversation. Such states of telepathic contact typically lasted for several hours.

For the rest of the night we talked telepathically, and it was effortless and instantaneous. When he went to pee outside, we were still talking to each other through the walls. (IDo6)

The experience lasted about 3½ hours. I was blown away by how long it was. When I realized it at first and confirmed it with my roommate, I burst into tears for the gratitude of being able to experience such a wonderful thing. We went outside and smoked a cigarette, thinking that was the end of that. Then we went back inside and continued to talk telepathically for the next few hours. (IDo5)

One important difference between this type of telepathic conversation and ordinary conversations, however, was that participants often found they could communicate in images rather than words. This was usually found to improve the information exchange, since trippers who struggled to find words could convey their ideas in pictorial form:

When I was explaining what I believed to my friend, I was doing it telepathically until I came to something I couldn't describe. When this happened I could picture what I was trying to say and I would ask, 'do you see the circle with the point in the middle?' etc., and my friend would say, 'yea I see it' and finish saying what I was trying to say. He could find the words to explain what I couldn't. (IDo5)

We could talk without words, transmitting feelings and picture-ideas directly. (ID19)

Furthermore, as indicated in the last quotation above, the telepathic exchange sometimes extended beyond thoughts and ideas into the realm of feelings. Reports of such experiences sometimes referred to them as 'telempathy' in order to differentiate this direct exchange of feelings from the more ordinary exchange of ideas. One described such telepathic exchanges as communication on the soul level, taking place on a level beyond words. Another person similarly found telepathy to be too mild a word for such communication, which was described as being able to know at a deep level what the other person means.

Finally, three interviewees described telempathy experiences that were of such intensity that they felt themselves dissolving into a state of unity with their partner. In these experiences, participants allegedly shared their feelings so intimately that it was difficult or impossible to identify which feelings belonged to whom.

Our consciousness, our thoughts, our feelings merged into one. This might be hard to visualize if you haven't experienced it, but it gives the effect that you literally ARE the other person. That they may be a projection of your own mind. I had melded into this person, and he was effectively a projection of my own mind. (ID13)

The difficulty was when some shadow stuff started coming up, as there was absolutely no boundary and no way to close myself off from my friend. He experienced all that was coming up for me directly and I experienced his stuff. Frankly, I don't know whose stuff it was, because there was one mind only. (ID10)

Differentiating actually became really difficult. In the early part of the experience it was easy, as the thoughts I would 'think' I recognized as my own and the thoughts that I 'knew' I recognized as being my roommate's. But as the night wore on it became increasingly difficult to differentiate my separate identity from my roommate's. (ID05)

Such states of telepathic unity were sometimes described as frightening. Psychedelics users who had experienced telepathic states cautioned against taking high doses of psychedelics with people one has unresolved issues with, claiming that relationships that are not ready for such a radical state of emotional openness might be harmed by it.

Privacy Issues

This piece of advice with regard to emotional readiness for telepathic experiences brings us to the main challenge reported for psychedelic experiences, namely the lack of privacy. One participant described how this feature of psychedelic telepathy made him uncomfortable with the experience:

You can't hide anything when you are telepathic with someone, and that I didn't like. Understanding how easily a person can know what you are thinking and infiltrate your mind really made me uneasy and really really really appreciate sobriety. People want to know everything, and they want to know how to be telepathic and that is great, but everything has a dark side. Ignorance is bliss. Having privacy is awesome. (ID05)

What was the most difficult for this participant was that his roommate, with whom he shared three telepathic experiences, turned out to be gay, and in the last experience this roommate started pressuring the interviewee for homosexual relations. Their earlier telepathic experiences had convinced the two that, on some level, all humans are in truth 'One', and this became an argument used to try to persuade the interviewee to agree to having sex. The interviewee did not appreciate being pressured by this argument, and the telepathic connection between the two made the situation especially uncomfortable, since there was no way to escape from the roommate's pressure.

The last time was a negative time for me though because he was gay and I am not, although I've played around with the idea. The entire time he was pressuring me into being gay. I

repeatedly told him that I did not want to, I did not find the male body attractive and just did not want to. And he said things like 'well you know we are all One so what is the big deal?' I replied 'it isn't a big deal except for the fact that I don't find men attractive and I don't want to, I don't care how One we all are, right now we are not one and I prefer women.' That night was awful because I had no way to escape his peer pressure and wanted it to end. (IDo5)

Another participant had a similar story. He shared three telepathic experiences with a friend who was a closeted homosexual and, as it turned out, interested in the interviewee. In their last telepathic experience, the interviewee could overhear his friend's romantic scheming telepathically, which the interviewee found to be dishonest and not forthright. He nevertheless maintained that the fear of losing one's mental privacy during telepathy experiences is overstated, because you would always pick up people's thoughts from a place of understanding and acceptance:

You may worry when you speak telepathically that maybe they will hear thoughts you don't want them to hear. But you feel everything in the context of their history and personality. It is very difficult to judge someone's thoughts when you experience that thought as if you are them. (IDo6)

A third interviewee experienced a similar dynamic from the opposite perspective. He went into a state of telepathic communication with his tripping friend, but this turned out to be a challenge when unexpected sexual desires rose up:

At some point I told him that I love him. He refused, but quickly realized that yes this was actually real love. We admitted love to each other (in no homosexual way at this point, mind you). But a little later, I started associating the whole thing with sexuality, started projecting my own sexuality onto it. Everything seemed very erotic, and I told my friend what I saw and that I did not want this. At this point, I

was getting really confused and our connection was broken. He stayed grounded and kept reminding me that these are only my thoughts, but I was really afraid. For days or even weeks afterwards I had this slight paranoia that everyone can hear my thoughts and feelings. I didn't feel safe in my own mind. (ID10)

Some others, however, did not regard the resultant mental nakedness of the telepathy experience as a problem. These people felt they had nothing to hide, and sometimes appreciated the increased openness:

I never felt threatened by the lack of privacy. In fact, it was a very nice feeling being able to be vulnerable around those I care about since I'm always so closed up. (ID08)

DISCUSSION

This study has explored psychedelic telepathy experiences among participants recruited from online discussion fora. Taking no stand on the veracity of the reports, the aim of the study was simply to explore how the psychedelic users themselves describe states of telepathy, and to categorize and compare the main elements of their narratives. All the narratives of telepathic communication involved communication between two or more partners or friends—often described as close friends or best friends—who were tripping on psychedelics together in the same room. All except two of the experiences were described as reciprocal. If telepathy is a real effect, it seems reasonable to expect it to run parallel to other forms of connections between people, which implies that it should be stronger and more easily identifiable between people who are emotionally close; this is congruent with tentative findings by Honorton et al. (1990) and with Roe et al.'s (2003) analysis. Indeed, one factor that seemed to facilitate telepathy in the reports available to this study was the wish or desire for a closer connection. There were several reports of telepathy with one's partner or spouse, and the three narratives that involved unrequited homosexual love stood out as noteworthy. Although there are not enough reports included in this

study to draw valid inferences, future telepathy researchers seem well-advised to study the role of romantic or erotic desire in establishing a telepathic connection.

The study identified two main forms for transition into a telepathic state and three main types of telepathic communication. Some experienced the transition as abrupt and somewhat challenging, while others described a transition so smooth as to be unnoticeable. It should be remembered that all the reports in this study were from people who experienced telepathy while tripping on, for the most part, heavy doses of psychedelic drugs, and the temporary inability to differentiate between spoken conversations and telepathic conversations that some reported should be understood in this context. It was not possible to identify any explanation for why interviewees experienced the transition phase so differently.

The three types of telepathic communication were not discrete states, but rather appeared to lie on a continuum. In its weakest form, telepathy seemed to resemble an ordinary spoken conversation, allowing simply for the exchange of verbalized ideas. This information-exchange type of telepathy often enabled people to communicate in images as well as words, however. A more intense form of telepathy was sometimes referred to as telempathy, and reportedly allowed for the direct exchange of feeling-states. Such experiences were often described in spiritual terms. Finally, the most intense form for telepathy was a state of self-dissolution where one could not differentiate one's own thoughts and feelings from those of the friend or partner. These experiences were often regarded as very challenging. Several interviewees also reported feeling uncomfortable over the lack of privacy that characterized the telepathic state. For some, this lack of privacy was sufficient reason to not want to repeat the experience, but others eventually grew accustomed to it. A few reported a normalization of telepathy experiences, regarding them as simply one of many fascinating features of the deep psychedelic state.

Another noteworthy characteristic of the telepathy narratives in this study is that they were often colorful and remarkable experiences. This characteristic contrasts with the standardized ganzfeld experiments conducted in parapsychological research, where the receivers are reported to pick the correct visual target one out of three times, rather

than one out of four times as chance would predict. While this effect, at least according to some studies and meta-studies (Storm et al., 2010; Williams, 2011), may lie outside the boundaries of normal statistical deviation, a relatively minor discrepancy in probabilities is not the type of effect that captures one's imagination. As the philosopher C. D. Broad emphasized back in 1949, spontaneous cases of psi are often

much richer in content and more interesting psychologically than the results of experiment with cards or drawings. In comparison with the latter they are as thunderstorms to the mild electrical effects of rubbing a bit of sealing-wax with a silk handkerchief. (Broad, 1949, p. 297)

However, it should be noted that the present study is subject to a range of obvious limitations. The study is based on Internet-mediated conversations with psychedelics users who claimed to have had telepathic experiences, but it was not possible to independently verify these reports. While the author had no reason to doubt the sincerity and truthfulness of the interviewees, neither of these is assured in principle. Some readers might even find that the fact that respondents were in a state of psychedelic intoxication while allegedly experiencing telepathic contact is in itself good reason to doubt the veracity of their reports.

Further Studies

In conclusion, further studies of psychedelic telepathy are clearly warranted. Furthermore, seeing that the ganzfeld experimenters, even when they can point to what appears to be solid statistical results, seem to have largely failed to convince the academic mainstream about the reality of psi, it might be advisable for parapsychologists to diversify their approach. In the following, I will therefore outline a research strategy for a study aiming to bring psychedelic telepathy into the laboratory. The final goal of this proposed study is to demonstrate telepathic communication between two experienced subjects within a controlled space. This is not an easy study to conduct, however, and will require long-term commitment from researchers.

Before proceeding, we can examine some earlier advice for

parapsychological research with psychedelics. Such advice often centers on the importance of set and setting, or in other words on the psychological and physical contexts of psychedelics use. Luke's (2015) summary of factors to take into consideration included "the participants' expectations, attitudes towards themselves, idiosyncratic perceptions, and emotional orientation to the experiment," and he emphasized the need for researchers to be friendly and supportive and thereby engender trust and acceptance among the participants (p. 160). This seems like good advice, but I would like to point out that this set of advice was probably intended for researchers conducting experiments with telepathically (and perhaps psychedelically) naive subjects. For the study I am proposing, I would instead recommend recruiting participants who have already experienced psychedelics-induced telepathy and, at least to some extent, have developed skills allowing them to recreate such experiences. If such participants can be found, it should be recognized that these participants, rather than the researchers, are the experts in determining which set and setting might facilitate a telepathic experience. In the early phase of the study, it seems advisable for the researchers to proceed more as anthropologists conducting a field study than as psychologists aiming for experimental control. Later on, if the field study phase indicates that the participants are capable of inducing telepathic states, the study could be moved into the researchers' laboratory and be repeated under controlled conditions.

The critical task for this study is to recruit suitable participants. Recruiting inexperienced participants into the laboratory and administering large doses of psychedelic drugs is not advisable, as the likelihood of untoward events rises with dosage (Nour et al., 2016; Studerus et al., 2012). In addition, the induction of telepathic states does not seem to be a sufficiently common effect of psychedelics use that such a straightforward approach is likely to succeed. Most of the interviewees in the present study found that they could not recreate the telepathic experience at will, but some of them claimed to have developed an ability to at least recognize and seize opportunities for a telepathic connection. The success of the proposed study relies on the supposition that these individuals were truthful and not deluded, and that they exist in sufficient numbers that a parapsychological researcher

will be able to recruit at least a pair of them. Recruitment might take the form of publishing notices at a range of online psychedelic communities, although this may result in much attention from pranksters and people hoping for free drugs. More fruitfully, perhaps, a prospective researcher may start by inviting online communities to a survey of psychedelic telepathy experiences, and at the end of the survey invite participants to follow-up interviews. Candidates for the experimental study may then be identified based on the information obtained in interviews. As an alternative, researchers may take a 'spear-fishing' approach where they monitor various psychedelic community fora and search through their archives in order to identify suitable candidates for the study, and then approach them individually via private messaging.

Assuming suitable candidates can be obtained, the researchers will need to engage with a gradual process of inserting themselves into the psychedelic practices of their subjects. This may be a delicate endeavor, as many psychedelics users regard the intoxicated state as a highly sensitive one, and may be uncomfortable with having strangers present. Unless the subjects are extremely proficient at inducing the telepathic state, simply transplanting them from their usual tripping environment into the researchers' lab and supplying them with psychedelic drugs is unlikely to work. Instead, the researchers must gradually earn the confidence of their subjects, starting out with a minimal presence at psychedelic sessions and slowly allowing the study participants to get used to their new environment. At some point, it may be possible to bring neutral observers and recording devices into the experiment. If telepathy is a real effect, such a study might be able to demonstrate it in a manner that does not rely on statistical probability, but rather on interactions with subjects undergoing real-time telepathic conversations.

REFERENCES

- Alcock, J. E. (2010). Attributions about impossible things. In S. Krippner, & H. L. Friedman (Eds.), *Debating psychic experience: Human potential or human illusion?* (pp. 29-41). Praeger.
- Bergson, H. (1990). *Matter and memory* (N. M. Paul & W. S. Palmer, Trans). Zone Books. [Original work published in 1896 in French]
- Bierman, D. J. (1998). The effects of THC and psilocybin on paranormal phenomena

- [paper presentation]. *Psychoactivity: A Multidisciplinary Conference on Plants, Shamanism, and States of Consciousness*, Amsterdam, Netherlands.
- Brinkmann, S., & Kvale, S. (2015). *InterViews: Learning the craft of qualitative research interviewing*. Sage.
- Broad, C. D. (1949). The relevance of psychical research to philosophy. *Philosophy*, 24(91), 291-309. <https://doi.org/10.1017/S0031819100007452>
- Cardea, E. (2018). The experimental evidence for parapsychological phenomena: A review. *American Psychologist*, 73(5), 663-677. <https://doi.org/10.1037/amp0000236>
- Carhart-Harris, R. L., Erritzoe, D., Williams, T., Stone, J. M., Reed, L. J., Colasanti, A., Tyacke, R. J., Leech, R., Malizia, A. M., Murphy, K., Hobden, P., Evans, J., Feilding, A., Wise, R. G., & Nutt, D. J. (2012). Neural correlates of the psychedelic state as determined by fMRI studies with psilocybin. *PNAS*, 109(6), 2138-2143. <https://doi:10.1073/pnas.1119598109>
- Don, N. S., McDonough, B. E., Warren, C. A., & Moura, G. (1996, August 17-20). Psi, brain function, and "Ayahuasca" (telepathine). *Proceedings of papers presented at the 39th Parapsychology Association Annual Convention, San Diego*, 315-334.
- Honorton, C., Berger, R. E., Varvoglis, M. P., Quant, M., Derr, P., Schechter, E., & Ferrari, D. (1990). Psi communication in the ganzfeld: Experiments with an automated testing system and a comparison with a meta-analysis of earlier studies. *Journal of Parapsychology*, 54(2), 99-139.
- Huxley, A. (1954/1994). *The doors of perception*. HarperCollins.
- Hyman, R. (2010). Parapsychology's Achilles heel: Persistent inconsistency. In S. Krippner & H. L. Friedman (Eds.), *Debating psychic experience: Human potential or human illusion?* (pp. 43-52). Praeger.
- Luke, D. (2010). Anthropology and parapsychology: Still hostile sisters in science? *Time and Mind*, 3(3), 245-265. <https://doi.org/10.2752/175169610X12754030955850>
- Luke, D. (2012). Psychoactive substances and paranormal phenomena: A comprehensive review. *International Journal of Transpersonal Studies*, 31(1), 97-156. <https://doi.org/10.24972/ijts.2012.31.1.97>
- Luke, D. (2015). Drugs and psi phenomena. In E. Cardea, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st century* (pp. 149-164). McFarland.
- Myers, F. W. H. (1896-1897). Glossary of terms used in psychical research. *Proceedings of the Society for Psychical Research*, 12(31, Supplement), 166-174. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v12_1896-7.pdf
- Nichols, D. (2004). Hallucinogens. *Pharmacology & Therapeutics*, 101(2), 131-181. <https://doi.org/10.1016/j.pharmthera.2003.11.002>
- Nichols, D. (2016, April). Psychedelics. *Pharmacological Reviews*, 68(2), 264-355.

- <https://doi.org/10.1124/pr.115.011478>
- Nour, M. M., Evans, L., Nutt, D., & Carhart-Harris, R. R. (2016, June). Ego-dissolution and psychedelics: Validation of the Ego-Dissolution Inventory (EDI). *Frontiers in Human Neuroscience*, 10, 1ñ16. <https://doi.org/10.3389/fnhum.2016.00269>
- Petri, G., Expert, P., Turkheimer, F., Carhart-Harris, R., Nutt, D., Hellyer, P. J., & Vaccarino, F. (2014, December). Homological scaffolds of brain functional networks. *Journal of the Royal Society Interface*, 11(101), 20140873. <http://dx.doi.org/10.1098/rsif.2014.0873>
- Roe, C. A., Holt, N. J., & Simmonds, C. A. (2003, March). Considering the sender as a PK agent in ganzfeld ESP studies. *Journal of Parapsychology*, 67, 129ñ146. <https://www.thefreelibrary.com/Considering+the+sender+as+a+pk+agent+i+n+ganzfeld+esp+studies.-a0104657313>.
- Storm, L., Tressoldi, P. E., & Di Risio, L. (2010, July). Meta-analysis of free-response studies, 1992ñ2008: Assessing the noise reduction model in parapsychology. *Psychological Bulletin*, 136(4), 471ñ485. <https://doi.org/10.1037/a0019457>
- Studerus, E., Gamma, A., Kometer, M., & Vollenweider, F. X. (2012). Prediction of psilocybin response in healthy volunteers. *PLoS One* 7(2), e30800. <https://doi.org/10.1371/journal.pone.0030800>
- Tinoco, C. A. (1994). Testa de ESP empacientes sob efeito da ayahuasca [Controlled ESP test in patients under the influence of ayahuasca]. *Revista de Brasileira de Parapsicologia*, 14, 42ñ48.
- Wezelman, R., & Bierman, D. J. (1997). Process orientated ganzfeld research in Amsterdam. *Proceedings of the 40th Parapsychology Association Annual Convention held in conjunction with the Society for Psychical Research*, Brighton, pp. 477ñ492.
- Williams, B. J. (2011, December). Revisiting the ganzfeld ESP debate: A basic review and assessment. *Journal of Scientific Exploration*, 25(4), 639ñ661.

HISTORICAL PERSPECTIVE

Maxwell Zombies: Mulling and Mauling the Second Law of Thermodynamics

D. P. SHEEHAN

Department of Physics, University of San Diego, San Diego, CA
dsheehan@sandiego.edu

Submitted August 5, 2019; Accepted February 7, 2020; Published September 15, 2020

<https://doi.org/10.31275/20201645>

Creative Commons License CC-BY-NC

Abstract Over the last decade two new classes of thermodynamic paradoxes have been investigated at the University of San Diego involving the recently identified phenomena of *epicatalysis* and *supradegeneracy*. These paradoxes add to a growing list of challenges to the second law of thermodynamics begun in the early 1990s. PACS numbers: 05.05.70.Ce, 05.20.-y

Keywords: second law of thermodynamics; non-equilibrium; epicatalysis; supradegeneracy; statistical mechanics; laser; photovoltaics; thermophotovoltaics; nafion; fuel cell

INTRODUCTION

The second law of thermodynamics states the principle that the entropy of closed systems never decreases in spontaneous processes. It is perhaps the most widely applicable physical law, operating in virtually every system in the universe consisting of more than just a few particles, from subatomic to cosmological length scales. It is often said that it “holds . . . the supreme position among the laws of Nature” (Eddington, 1935).

The status of this law has been a subject of discussion for nearly 170 years. Due to its centrality to many branches of science and engineering, any exception to it would be fundamentally important, especially to physics and chemistry. The most celebrated second law

challenge is Maxwell's demon, an intelligent microscopic creature that sorts molecules on an individual basis, creating pressure or temperature gradients from which work is derived (Maxwell, 1872). Various incarnations have been summoned and exorcised by scientists of each age, including Smoluchowski, Szilard, Brillouin, Gabor, Feynman, Penrose, Bennett, Landauer, and Zurek (Leff & Rex, 2003). By the early 1990s, the demon was pronounced dead. Cause of death: *the thermodynamics of information erasure* or, more colloquially, *thinking too much*. The demon may have died, but its progeny did not (Sheehan, 2018a).

Over the last 25–30 years the second law has faced unprecedented skepticism, led by several dozen challenges from researchers worldwide, international conferences (Sheehan, 2002, 2011, 2007a), as well as the first scientific monograph on the subject (Çepik & Sheehan, 2005). Unlike the original Maxwell demon, many contemporary challenges are *big* (macroscopic, hence not prone to failure via thermal fluctuations); *dumb* (do not carry out calculations, making information erasure irrelevant); and *durable* (more difficult to dispel than Maxwell's demon), hence their name: *Maxwell zombies* (Sheehan, 2018a). These have assumed the mantle of the demon, many stubbornly resisting resolution by the scientific community for decades. Several have been reviewed in this journal (Sheehan, 1998a, 2008). Their steadily increasing number and potency—in some cases corroborated by experiment (Sheehan, 1995, 1996, 2001, 2014, 2016)—strain the uncritical acceptance of the second law as absolute. Most are theoretical, but an increasing number are experimental, a few purporting actual violation (Sheehan et al., 2014).

The newest wave of Maxwell zombies is based on the recently identified phenomena called epicalysis (Sheehan, 1998b, 2013) and supradegeneracy (Sheehan & Schulman 2019). This article considers them in both theoretical and practical terms. Just as it was necessary 150 years ago for Maxwell's demon to 'dirty its hands' with 19th-century work to make its point (e.g., pushing a piston in a cylinder), modern challenges sport 21st-century technologies to make theirs (e.g., lasers, thermophotovoltaics).

The 'second law' group at the University of San Diego (USD) has advanced roughly a dozen challenges since the early 1990s. The first four (plasma-electrical, plasma-pressure, chemical, and gravitational) were reviewed in *JSE* (Sheehan, 1998a) in 1998. It was shown that these as well as later challenges can be explained in terms of two

broken symmetries: one geometric, one thermodynamic. In a second *JSE* review (Sheehan, 2008), another class of USD challenges was discussed, involving *nano-* and *microelectromechanical systems* (NEMS and MEMS). These microscopic, semiconductor-based, resonant oscillators had the advantage of operating at room temperature, as opposed to the earlier plasma and chemical ones that required temperatures in excess of 1000 K, plus they could be fabricated using well-established micro- and nano-fabrication techniques. Theoretical analysis, numerical simulations, and corroborating laboratory experiments mutually supported their potential viability. Theoretical upper-limit power densities were predicted to be prodigious ($\rho \geq 10^9$ W/m³), as were fabrications costs.

Second law research at USD over the last 30 years has arced steadily from the *conceivable* toward the *realizable*. In the 1990s, challenges were mostly theoretical, but now, in 2020, commercial devices are being contemplated. The initial generation of USD challenges (Gen I) required either high temperatures ($T > 1000$ K), low pressures ($P \leq 10^{-4}$ Torr), exotic materials (e.g., tungsten, rhenium, tantalum), or astronomically large gravitational masses (e.g., mass of Moon). Although possible in principle, they had little commercial potential and were difficult to verify experimentally.

The second generation of USD challenges (Gen II) improved over Gen I in that they could operate at room temperature, and they relied on well-established solid state fabrication technologies. Still, they remained difficult and expensive to create.

This article reviews a third generation of challenges (Gen III). Like Gen II, these should operate at room temperature, but additionally they might be far less expensive to fabricate. Intellectual property protection has been sought for their core ideas (Sheehan, 2015, 2020a), unlike for Gen I and II, which were judged too academic and theoretical to be worth securing. Gen III are based on two recently recognized and broadly applicable physical phenomena: epicalysis and supradegeneracy. Four distinct challenges involving them are reviewed here.

The remainder of this article is as follows. The next section reviews epicalysis theory, experiment, and challenges, followed by a complementary discussion for supradegeneracy. The Discussion section considers general thermodynamic issues.

EPICATALYSIS

The term *epicatalysis* was coined in 2013 (Sheehan, 2013), though its origins can be traced back at least a century; it was also tacitly invoked in Gen I challenges since the early 1990s. As its name implies, epicatalysis is related to standard catalysis, but with a twist. Conventional (positive) catalysts satisfy the three criteria, specifically they: (i) speed up their chemical reactions by providing low activation energy routes between reactants and products; (ii) participate in, but are not consumed by, their chemical reactions; and (iii) do not alter the final equilibria of their reactions. Epicatalysts abide by conditions (i) and (ii), but they break (iii). The concept of epicatalysis has been broadened by other researchers to encompass a wider array of phenomena and processes than originally envisioned, notably by J. Denur, who has applied it to gas-gravitational systems (Denur, 2018).

In USD challenges, epicatalysis applies to gas-surface reactions in which the gas-phase mean free path (λ) is comparable or long compared with the size of the confining vessel (L), whose walls presumably contain epicatalysts. (For comparison, the mean free path for air molecules at STP is roughly 70 nm, a hundred times smaller than a red blood cell.) Epicatalysts have strong physical or chemical affinities for the gas and are able to break chemical bonds or ionize atoms. Examples include molecular hydrogen dissociation on heated transition metals (e.g., tungsten, molybdenum, rhenium; $H_2 \rightarrow 2H$), and surface ionization of alkali metal or alkali earth metals (e.g., potassium, cesium, barium) on high-temperature, high work function metals (e.g., tantalum, tungsten; $Cs \rightarrow Cs^+ + e^-$). Because epicatalysts operate in the high Knudsen number regime ($\lambda \geq L$), the distinct gas phase products desorbing from the epicatalysts are not disposed to collide, hence react, in the gas phase. Thus, they are unable to attain standard gas phase equilibrium; instead, the gas phase retains the fingerprint of the epicatalytic surface from which it desorbs. (At everyday gas number densities, the mean free path is so short that gas phase equilibrium is quickly attained very near a surface even if epicatalytic effects are present.)

Different epicatalytic surfaces can desorb distinct chemical products at the same temperature and gas number density. For instance, it has been known for decades that different transition

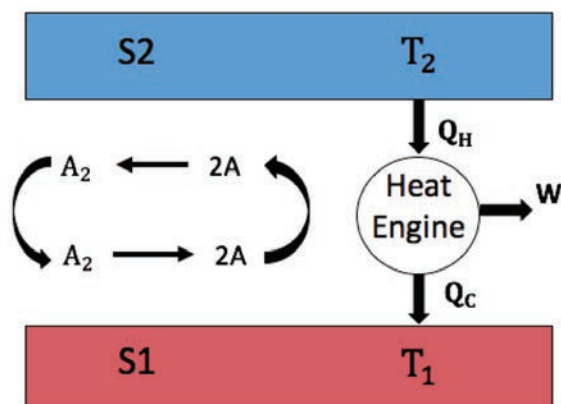


Figure. 1. Epicalysis Cycle. Molecule A_2 surface dissociates into monomers A , drawing thermal energy from S_1 , then $2A$ cycle to S_2 where they recombine back into A_2 , depositing thermal energy in S_2 before cycling back to S_1 . Temperature differential $\Delta T = T_2 - T_1$ drives a heat engine.

metals demonstrate different propensities for dissociating molecular hydrogen. For example, rhenium dissociates hydrogen better than tungsten at low pressures and high temperatures. Dissociation is an *endothermic* process (absorbs heat), thus, under otherwise identical conditions, rhenium tends to cool compared with tungsten when it dissociates hydrogen. Conversely, an *exothermic* process evolves heat such that a surface that recombines hydrogen well tends to heat relative to a surface that recombines hydrogen poorly.

Epicalysis itself does not undermine the second law in fact, it relies upon it but when two or more epicalysts operate upon the *same* gas in the *same* closed vessel, thermodynamic paradoxes can arise. Consider Figure 1, which depicts a cavity within which dimer gas A_2 circulates between two epicalytic surfaces (S_1 and S_2). The gas A_2 preferentially dissociates on S_1 ($A_2 + \Delta E \rightarrow 2A$, where ΔE is the dissociation energy for A_2), and then desorbs as two A atoms into the gas phase. These A species are then adsorbed on epicalytic surface S_2 , where they preferentially recombine back into A_2 and desorb, releasing the recombination energy S_2 ($A + A \rightarrow A_2 + \Delta E$). The result of this cycle is a net transfer of thermal energy from S_1 to S_2 . (Gas phase reactions are not relevant here because this is an epicalytic system with a long mean free path ($\lambda > L$).

After many cycles of the gas through the cavity absorbing, desorbing, dissociating, and recombining an equilibrium is established, but one foreign to traditional thermodynamics. First, the gas phase is not described by normal gas phase equilibrium concentrations; rather, it bears the distinctive chemical imprints of S_1 and S_2 . Second, and most critical to this study, the temperatures of S_1 and S_2 can be distinct. For the scenario pictured in Figure 1, one has $T_2 > T_1$ because S_1 preferentially dissociates A_2 , thereby cooling, while S_2 preferentially recombines $2A$ into A_2 , garnering thermal energy, and therefore heats. This ‘equilibrium’ is peculiar from the viewpoint of standard thermodynamics, which demands that closed systems like this settle down to a single temperature. This steady-state temperature difference by itself constitutes at least a *soft violation* of the second law (Moddel, 2019, personal communication), but this can become a *hard violation* if a heat engine (e.g., a thermoelectric generator) is attached between S_2 and S_1 such that heat flows and performs work (e.g., thermoelectricity).

The theory of epicatalysis was originally posed in terms of pressure differentials (Sheehan, 1998b), but temperature is a conjugate thermodynamic quantity, also able to perform work. Fifteen years later, the term *epicatalysis* was coined and the phenomenon explained in terms of kinetic theory (Sheehan, 2013). In 2017, a thermodynamic justification for epicatalysis was demonstrated using the symmetrized van 't Hoff equation (Sheehan, 2018b). This showed that neither kinetic theory nor microscopic analysis are necessary to challenge the second law; standard thermodynamics is sufficient. In this sense, traditional thermodynamics can be seen to be logically inconsistent. This author believes the inconsistency can be traced largely to an unrealistic idealization that permeates traditional thermodynamics, the so-called *thermodynamic limit* (Sheehan & Gross, 2006).

Experimental support for epicatalysis has been found in both plasma and chemical systems. In 2013, large steady-state temperature differences ($\Delta T \geq 120$ K) were measured in high-temperature hydrogen/W/Re blackbody cavity experiments; from these, areal power densities of roughly 10^4 W/m² were inferred (Sheehan et al., 2014). Depending on one's tastes, this could be interpreted as either a hard or a soft (Moddel, 2019) violation. In 2015, evidence for *room temperature* epicatalysis was discovered in hydrogen-bonded dimer

systems (Sheehan et al., 2016) (e.g., formic acid dimers) reacting with hydrophilic surfaces (e.g., kapton). Although the room-temperature experiments were not conclusive concerning second law status because temperature differentials were not measured (or sought) their results raise hopes for a commercial second law technology in the form of an *epicatalytic thermal diode* (ETD), a device that rectifies thermal energy analogously to how an electrical diode rectifies electricity. This one-way valve for thermal energy can establish steady-state temperature differentials that, in principle, can be employed in a heat engine (Sheehan, 2015). ETDs are predicted to have applications across the entire energy sector (Sheehan, 2018a). Numerical simulations of room-temperature ETDs (Sheehan & Welsh, 2019), using realistic physical parameters and accounting for convective, conductive, and radiative heat transfers, predict temperature differentials in excess of 100 K and areal thermoelectric power densities up to several times 10^4 W/m².

A practical ETD faces a number of potential hurdles. Although evidence has been found for room-temperature epicatalysis, temperature differentials and power extraction have not yet been demonstrated; even if they are, successful commercialization presents an entirely new set of conditions to be met.

Overall, epicatalysis undergirds potent thermodynamic challenges, some with attractive commercial prospects (Sheehan & Welsh, 2019). They have been demonstrated theoretically via microscopic analysis, kinetic theory, and traditional thermodynamics, experimentally verified and corroborated in plasma and chemical systems, and explored via numerical simulations. Many of the chemicals and surfaces necessary to construct ETDs are inexpensive and can be found in modern homes. Room-temperature epicatalysis experiments, seeking both soft and hard second law violations, are proceeding at USD.

SUPRADEGENERACY

The phenomenon *supradegeneracy* has produced a variety of second law challenges, involving lasers, chemical membranes, thermophotovoltaics, and perhaps applications to biology. Its formal derivation is relatively recent (2016) (Sheehan & Shulman, 2019), but its roots can be traced back at least a decade (Sheehan, 2007b). In fact, supradegeneracy

could have been discovered at the dawn of statistical mechanics, perhaps 140 years ago, but somehow it was overlooked, perhaps because no natural systems exhibited it.

Supradegeneracy can be understood heuristically as follows. Imagine a particle placed on a multiply forked path (Figure 2), subject to Brownian motion, that is, to random thermal excursions. The path bifurcates, trifurcates, or multifurcates. At each node the particle's next step is chosen randomly from its possibilities, one to the left and three to the right. Over time, the particle drifts to the right for purely statistical reasons because there are more ways for it to move to the right than for it to move to the left. This preference is a manifestation of the *entropic force*, $F_{\nabla S}$, which is defined as the product of temperature (T) and an entropy gradient ($\nabla S \sim \frac{\delta S}{\delta x}$), i.e., $F_{\nabla S} = T \nabla S$. This statistically-based force is well-established (Neumann, 1980; Sokolov, 2010), especially in biological systems where it is critical to a number of phenomena, including diffusion, osmotic pressure, and polymer folding and coiling (Nelson, 2004).²⁹

Now consider the energy levels of an arbitrary quantum-thermodynamic system (Figure 3). The number of states at a given energy level (E_n) is called its degeneracy, g_n . In Figure 3, for example, the degeneracies of levels 3 and 4 are two and five, respectively. The energy difference between the two levels is $\epsilon \equiv E_4 - E_3$.

It is a central maxim of statistical physics that, at equilibrium and at temperature, the ratio of occupation probability for two arbitrary levels $n+1$ and n is given by (Pathria, 1985; Reif, 1965; Schroeder, 2000)¹

$$\frac{P_{n+1}}{P_n} = \frac{g_{n+1}}{g_n} e^{-\epsilon/kT}, \quad (1)$$

where k is the Boltzmann constant. For the case of energy levels 3 and 4 in Figure 3, one has $\frac{P_4}{P_3} = \frac{5}{2} e^{-(E_4 - E_3)/kT}$.

For most thermodynamic systems the uppermost levels are less populated than lower ones (i.e., $\frac{P_{n+1}}{P_n} < 1$) because level degeneracies are typically of order unity $\frac{g_{n+1}}{g_n}$, while energy differences between

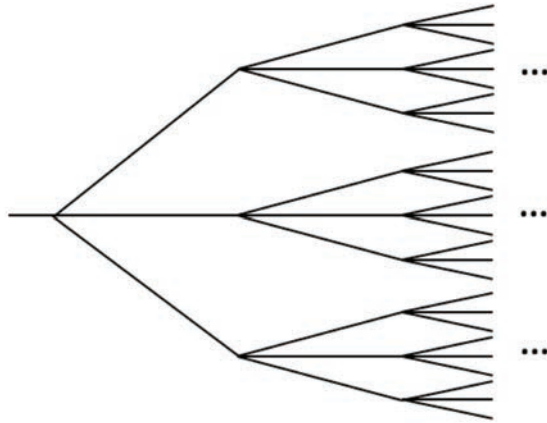


Figure 2. Heuristic model of supradegeneracy.

them are much greater than thermal increments $\left(\frac{\epsilon}{kT}\right) \gg 1$ so that the Boltzmann exponential (factor) is much less than one $(e^{-\epsilon/kT} \ll 1)$, therefore it dominates the overall probability ratio, giving $\frac{P_{n+1}}{P_n} < 1$. Only in special circumstances is it found that $\frac{P_{n+1}}{P_n} > 1$ in the uppermost levels, e.g., with population inversion in lasers, but these usually require some sort of nonequilibrium pumping, for instance chemical reactions, electrical discharge, or optical pumping with a flash lamp or laser.

But there's a catch. Notice that the probability ratio in Equation (1) can be written in a more suggestive form:

$$\frac{P_{n+1}}{P_n} = \frac{g_{n+1}}{g_n} e^{-\epsilon/kT} = \exp \left[\ln \left(\frac{g_{n+1}}{g_n} \right) - \epsilon/kT \right] = e^\gamma. \quad (2)$$

Note that if $\ln \left(\frac{g_{n+1}}{g_n} \right) > \epsilon/kT$, then $e^\gamma > 1$, which means that the higher levels can be more populated than the lower ones $\left(\frac{P_{n+1}}{P_n} > 1\right)$. In other words, if level degeneracies increase rapidly enough, degeneracy can dominate the Boltzmann factor to create

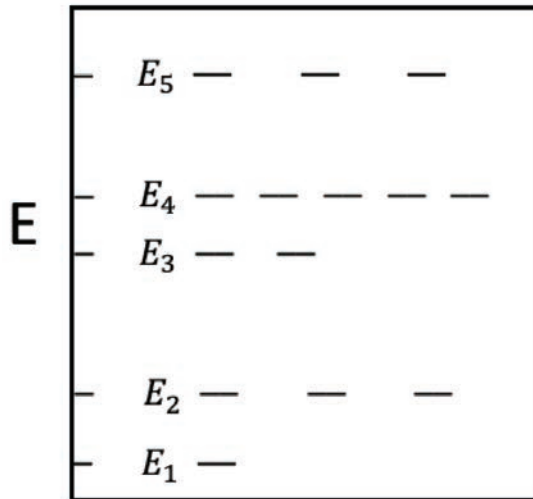


Figure 3. Energy level diagram with conventional degeneracies.

what amounts to population inversion *at equilibrium* without requiring *nonequilibrium* pumping. This is supradegeneracy (Sheehan & Schulman, 2019).

A *supradegenerate energy ladder* is depicted in Figure 4, where ϵ is taken to be the same between levels, and degeneracy increases exponentially as $g_n \sim p^n$ with $p > 1$ and n is an integer. Analysis (Sheehan & Schulman, 2019) indicates that if viable transitions exist between the upper states of the energy ladder and lower states (Path 2 in Figure 4), then in principle steady-state particle currents can circulate in the system: particles climbing the energy ladder, falling down Path 2 back down to the ladder base (with switch open), then climbing up again. Steady-state currents are hallmarks of non-equilibrium (Attard, 2012; Gaveau et al., 2009; de Groot & Mazur, 1984; Zwanzig, 2001) and can lead to second law challenges, especially if the descending particles (Path 2) carry suprathreshold energy ($E \gg kT$). Numerical studies corroborate the potential for such supradegenerate currents and predict they should be maximized for $\epsilon \beta \sim 1$. That is, energy steps of roughly kT optimize upward energy currents, an intuitively satisfying result.²

To be clear, the *net* currents to and from the ground level and the upper energy level are nonequilibrium ones for both Paths 1 and 2.

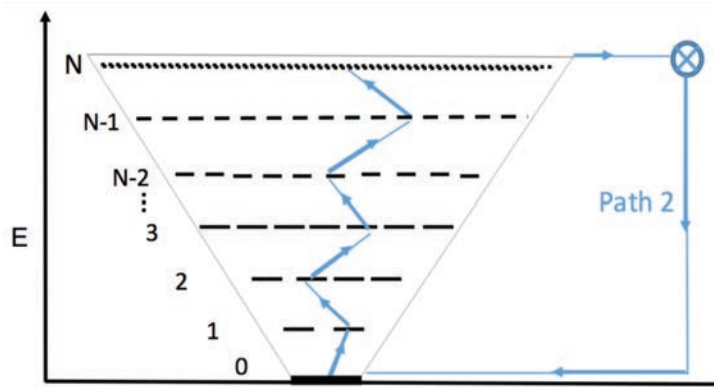


Figure 4. Supradegenerate energy ladder. State degeneracy increases as $g_n \sim p^n$, satisfying Equation (2). Direct (single step) path down from top rung indicated (Path 2 with switch \otimes).

The climb up the energy ladder (Path 1) is a nonequilibrium process because it is time irreversible; that is, it is highly probable for it to climb up, but it is very improbable for it to climb down. Additionally, starting from the ground level, it is highly improbable for the system to thermally jump up to the upper-most level, either via Path 1 or 2. In contrast, the nonequilibrium flux downward along Path 2 is favored, both energetically and statistically, plus it is nonequilibrium since, presumably, suprathermal work can be extracted in the fall. In effect, the net fluxes up Path 1 and down Path 2 are nonequilibrium ones constituting a net circular current and a second law paradox if work is derived from the downward current.

Denur (personal communication) noted that some naturally occurring systems exhibit many of the features of supradegeneracy, for example a gas in a uniform gravitational field confined to an upwardly rising, flaring conical chamber (like a birch trumpet) whose flare rate is large enough that the gas particle number versus altitude satisfies the supradegeneracy statistical criterion ($e^\gamma > 1$). Particles climb the energy ladder using thermal energy; the upper energy levels can be considered a population inversion and their energies suprathermal. Unfortunately, the practicalities of such a scenario make it very unlikely that it could arise *naturally* on any planet or satellite. This gas (atmosphere) would be driven away from equilibrium by solar

irradiance and the cone (on Earth) would likely have to extend nearly into space to satisfy the suprathermal criterion ($E \gg kT$).³ Additionally, the conical gas provides no clear route to a second law challenge.

The energy ladder must be capped at a finite maximum ($n = N$), otherwise the system can achieve infinite energy, clearly an unphysical result.⁴ No naturally-occurring supradegenerate systems are known and this itself is mysterious⁵ but manmade supradegenerate systems seem achievable. Two are presently being pursued at USD.

An early form of supradegeneracy appeared in a proposal for a new (third) category of life (Sheehan, 2007b). At present only two categories are recognized: (a) chemosynthetic life, which is animated by chemical reactions (e.g., animals); and (b) photosynthetic life, which is powered by light (e.g., plants). In 2006, a third category was proposed (*thermosynthetic life*) that would be driven by thermal energy from the environment, contravening the second law (Sheehan, 2007b). (It is easily shown that the thermal energy inside and closely surrounding any cell is more than enough to power it, were the second law violable.) The best candidates for *thermosynthetic life* are predicted to be single-celled, superthermophilic, hyperbarophilic anaerobes confined several kilometers down in the earth's crust where it might have an energetic advantage over traditional *free-energy* life forms. Crucial to its proposed operation is a multi-tiered supradegenerate energy ladder constructed inside its cell membrane. Recently, the intriguing proposal has been advanced that everyday cellular life might already be harvesting thermal energy from its surroundings, using standard cell membrane machinery (Lee, 2019).

Man-made supradegenerate systems appear possible, and these could constitute the most eclectic class of second law challenges yet proposed. We now review three of the most promising.

Laser

Dozens of types of lasers are known (Milonni & Eberly, 1988; Saleh & Teich, 1991), and many more are possible.⁶ Conventional lasers (Figure 5) require at least three quantum states: (1) ground state (g.s.), a low-energy state where the majority of molecules reside at equilibrium; (2) a long-lived metastable state (m.s.) that acts as

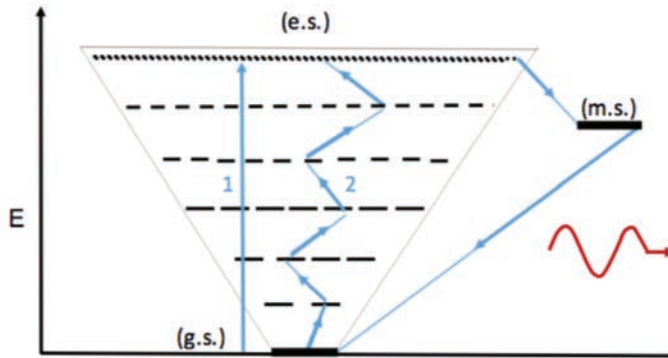


Figure 5. Three level laser. Conventional single step nonequilibrium pumping (Path 1); and pumping via multi-step supradegenerate energy ladder (Path 2). Laser light (red) emitted in (m.s. \rightarrow g.s.) transition.

a reservoir of energy for the lasing transition (m.s. \rightarrow g.s.); and (3) an excited state (e.s.) that feeds the metastable state and is pumped from the ground state by a nonequilibrium process, like a chemical reaction, electrical discharge, or optical pumping from another laser. The pump step in a traditional laser is accomplished via a single large, suprathreshold transition ($\Delta E \gg kT$), as indicated by Path 1 in Figure 5. The excited state partially decays to the metastable, where a population inversion builds, and from there decays en masse, via stimulated emission, to create laser light.

A *supradegenerate laser* operates similarly to this conventional laser but with a major distinction: The supradegenerate laser makes the (g.s. \rightarrow e.s.) transition via an energy ladder consisting of a series of small, roughly thermal increments ($\Delta E \sim kT$), as indicated by Path 2. One can liken the difference between these two paths to the difference between ascending a tall building in a single bound (Path 1) versus via the stairs (Path 2). Both achieve the same end, but by very different thermodynamic processes. Conventional lasers require *nonequilibrium* processes that entail external energy inputs (pumping), while the supradegenerate laser draws thermal energy directly from its environment *near equilibrium* to reach the excited state. More importantly, the conventional laser upholds the second law, whereas the supradegenerate laser violates it. Specifically, it contravenes the Kelviniñ

Planck form of the law, which forbids transforming a quantity of heat solely into work (e.g., laser light) in a thermodynamic cycle.

The supradegenerate laser energy ladder has partial precedents with multiphoton pumping of organic dyes (He et al., 2002; Zhang et al., 2019; Zheng et al., 2013), nanocrystal systems (Li et al., 2015; Wang et al., 2014; Xing et al., 2012) and atoms (Garrett et al., 1996), which sometimes use intermediate states and multiple frequencies, but these adhere to the second law. Attractive candidates for supradegenerate laser ladders include impurity states in the bandgaps of insulators (e.g., alumina, quartz, titanium dioxide) and semiconductors (e.g., silicon, germanium, gallium arsenide). Particular incarnations of the supradegenerate laser are not known but are under study.

Concentration Graded Chemical Membrane

Capacitors are mainstays for electronic energy storage. The archetypal version consists of two parallel plates that are charged (energized) by an external power supply. It appears possible to create *thermally charged capacitors* using energy ladders built into concentration-graded chemical membranes, as depicted in Figure 6.

The supradegenerate capacitor could consist of a series of layers whose chemical concentrations of a charge-transfer molecule or polymer, e.g., ionomer (Eisenberg & Kim, 1998; Kreuer, 2003; Rogers & Ubbelohde, 1950) vary exponentially from bottom to top, satisfying the supradegeneracy condition, Equation (2). An attractive candidate is the *proton exchange membrane* (PEM) polymer nafion, which conducts hydrogen ions (protons) not electrons and whose number density of charge-transfer sites (sulfonic acid groups) can be varied widely and continuously. If the concentration of nafion is varied from low to high from the bottom to top layers of the membrane stack, an upward-pointing entropy gradient is created that should operate as an energy ladder for protons. Protons introduced at the bottom of the ladder (e.g., an acid bath, HCl) should experience an entropic force upward, such that H^+ ions accumulate at the top of the ladder, leaving negative counterions (e.g., Cl^-) at the base.

The stack generates an electrostatic potential up to a value at which further charge separation stops due to a balance between entropic and electrostatic forces. Analysis indicates that this can be

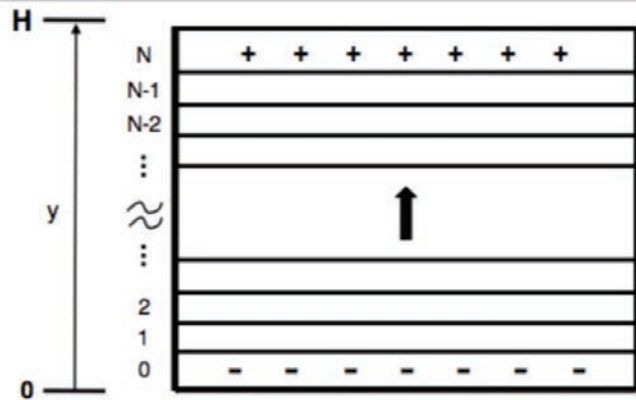


Figure 6. Supradegenerate thermally charged capacitor. Discrete energy ladder with $N + 1$ levels, energy increment ϵ , maximum energy $E_{\text{max}} = \epsilon N$, and degeneracy increasing vertically, with $g_n = p^n$. Charge separation (+/-) due to positive charge transport up ladder, leaving negative counter ions at base.

up to several hundred millivolts. Analogous thermally generated, self-limiting electrostatic potentials and energies are well-known in plasma (Chen, 1984; Debye & H ickel, 1923; Ichimaru, 1980) and semiconductor (Neudeck, 1989; Mouthaan, 1999; Dimitrijevic, 2000) systems, so this supradegenerate one is not surprising.

This arrangement constitutes a *thermally-charged capacitor*. Its capacitive energy can be written, $U = \frac{1}{2} CV^2$, where V is the net voltage across the membrane; capacitance is $C = \frac{\kappa \epsilon_0 A}{d}$, with κ the effective dielectric constant of the membrane, ϵ_0 the permittivity of free space, A the cross-sectional area of the membrane, and d its thickness. Electromechanical means to exploit this capacitive energy while undermining the second law has been explored in the context of MEMS/NEMS semiconductor oscillators (Sheehan et al., 2002; Sheehan et al., 2005).

A nafion capacitor energy ladder is currently under experimental investigation at USD. Initial experiments involving discrete nafion ladders corroborate the polarity and approximate magnitudes predicted for supradegenerate membrane voltages.

Thermophotovoltaics

Photovoltaics (PV) convert light into electricity (Mertens, 2014; Smets et al., 2016). Solar PVs, for example, utilize the blackbody (thermal) radiation from the Sun ($T = 5800$ K). *Thermophotovoltaics* (TPV) (Bauer, 2011) also convert light into electricity, but typically use cooler thermal sources (e.g., hot filament or rod), usually with $T < 2000$ K. Though closely related, TPV is the poor cousin of solar PV, principally due to the technical difficulties connected with producing, maintaining, and powering the TPV radiation source; by contrast, the thermal radiation for solar PV (sunlight) arrives freely. Typical TPV semiconductors include germanium, gallium antimonide, indium gallium arsenide antimonide, or other narrow- or medium-gap semiconductors.

A conventional TPV/PV converter is a p-n diode, pictured in Figure 7. A photon (red squiggly arrow in Figure 7) excites an electron in a single transition from the valence band of the p-region into the conduction band, as indicated by Path 1, leaving behind a hole in the valence band. The electron is swept to the negative electrode by the electric field of the depletion region and the hole to the positive electrode. The electrodes can be connected across an electrical load to perform work. Here the electron recombines with the hole, and the cycle can repeat with another photon. In sum, photonic energy is converted into electrical energy.

The *supradegenerate thermophotovoltaic* (STPV) operates almost identically to the standard TPV, with one exception. In the STPV, the electron crosses from the valence band to the conduction band via a series of small, incremental steps ($\Delta E \sim kT$) up a supradegenerate energy ladder constructed across the bandgap (Path 2, Figure 7), rather than via a single large jump as in a standard TPV. Once across, the electron and hole should proceed as in a conventional TPV, performing work on the load. This scenario, however, conflicts with the Kelvinian Planck statement of the second law.

The STPV energy ladder is conceptually simple. Impurities in semiconductors can express themselves as energy states in the bandgap (Ibach & Lüth, 2009; Milnes, 1973;). For example, with a silicon substrate (bandgap width 1.1 eV) the acceptor (p-type) impurities boron, gallium, and indium create energy states 0.045 eV, 0.072 eV,

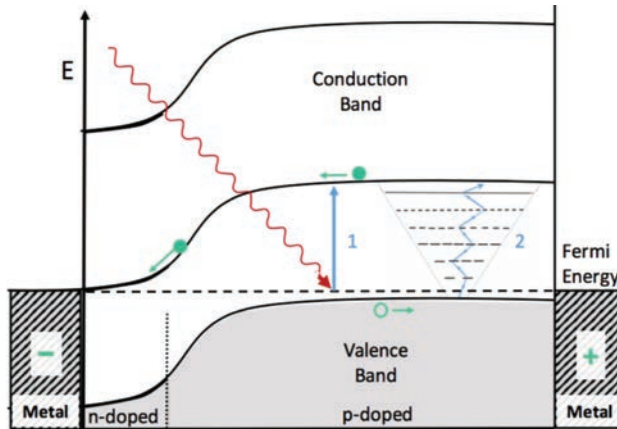


Figure 7. Conventional and supradegenerate thermophotovoltaic (STPV). In conventional PV or TPV, a photon excites an electron directly from the valence band to the conduction band. In STPV, an electron climbs the energy ladder to the conduction band using only ambient thermal energy.

and 0.16 eV, respectively, in the bandgap just above the valence band edge. If the impurity concentrations are set at roughly 10^{15} cm^{-3} , 10^{16} cm^{-3} , and 10^{17} cm^{-3} , respectively, these three impurities could constitute an elementary, three-tier energy ladder roughly $1/7$ of the way up into the silicon bandgap. The supradegeneracy condition, Equation (2), is approximately satisfied. This silicon energy ladder is currently under experimental investigation at USD.⁷

Should this test ladder succeed, a $4\text{ñ}5$ rung ladder will be attempted across a so-called *narrow-gap semiconductor* whose bandgap is $E_{\text{bg}} \leq 0.3 \text{ eV}$. Candidate narrow-gap semiconductors (Dornhaus et al., 1983; McGill & Collins, 1993) include indium antimonide ($E_{\text{bg}} = 0.17 \text{ eV}$), lead selenide ($E_{\text{bg}} = 0.27 \text{ eV}$), and mercury cadmium telluride ($0 \leq E_{\text{bg}} \leq 1.5 \text{ eV}$). As shown elsewhere (Sheehan, 2020b), a pñn diode with an $\sim 0.3 \text{ eV}$ bandgap, a $4\text{ñ}5$ rung energy ladder (with appropriate concentration jumps between impurities), might operate as a *room-temperature* STPV. Assuming that rung spacings are roughly $\epsilon \approx 1 - 2kT$, the InSb bandgap could be completely bridged by just $2\text{ñ}4$ well-placed impurities. These STPVs would contravene the second law because thermal energy (driving electrons up the ladder) has been converted solely into electrical energy. (Even if it fails as a second law

challenge, the STPV ladder could improve the efficiency of standard PVs and TPVs by providing additional stepping stones by which a broader portion of solar or thermal spectra could be harvested (Sheehan, 2019).

Refrigeration is a natural byproduct of supradegenerate (and epicycatalytic) work cycles. If work is produced at the expense of the system's ambient thermal energy, then the first law of thermodynamics requires that the device cool, especially if it is thermally isolated from its heat reservoir. As one application, high-performance computer chips are often compromised by ohmic heating and require heroic cooling measures. On-chip supradegenerate refrigerators might not only offset ohmic heating but in principle also contribute to the chip's electrical power. Such zero-net-power, perpetual computing has been proposed (Sheehan, 2010; Yeung, 2002). As a bonus, this application could help answer longstanding questions at the intersection between thermodynamics and information theory (Shannon, 1948; Yeung, 2002), such as the fate of Maxwell's demon (Bennett, 1982; Leff & Rex, 2003; Maxwell, 1872) and the physics of Landauer's principle (Earman & Norton, 1998, 1999; Landauer, 1961).

DISCUSSION

Epicycatalysis and supradegeneracy are foundational to Gen III challenges, but they themselves do not conflict with the second law. In fact, the peril posed by the Maxwell zombies depends critically on the faithful operation of the second law.⁸ Remarkably, in each step of the zombic thermodynamic cycles, the second law is satisfied, and its violation cannot be pinned on any individual step; rather, it is only in assessing the cycle in toto that the law is contravened. An analogous claim can be made of the classic Carnot work cycle: Each individual step satisfies the second law and no individual operation depends directly on any of the others, but together in proper sequence and subject to suitable boundary conditions and constraints, they complete a work cycle. The difference between the Carnot and Maxwell zombie cycles is that the former generates net entropy, while the latter consumes it.

One might suspect, especially given the omniscience often ascribed to it, that the second law should be able to look ahead in a zombic cycle and somehow find a way to foil it, but this mistakes the law's modus

operandi. The second law neither remembers the past nor plans for the future: It operates strictly in the present, maximizing the entropy of its immediate environment as quickly as possible, subject to its boundary conditions and physical constraints. As such, it is blind to higher-order, meta-phenomena like the overall thermodynamic cycle. (It is blind in an analogous way that natural selection is blind in its support of the meta-phenomenon, evolution.) Maxwell zombies use the second law's temporal shortsightedness and entropic greed against it.

Ultimately, the second law is a physical axiom based on experimental observations of Nature; it is true only because it is observed to be so. Likewise, Maxwell zombies, no matter how compelling, cannot be considered actual violations until they are successfully reduced to practice. Although claims to this effect have been made (Sheehan et al., 2014), they have not been accepted by the scientific community. It is the opinion of this author that such claims will continue to be dismissed or ignored until a commercial application is realized, at which point the scientific community's imprimatur becomes superfluous. It is here that Gen III devices find their value because of their commercial potential.

Gen III challenges are the culmination of the previous two generations. It would have been difficult to arrive at them *ex nihilo*; actually, the shortcomings of Gens I and II were their spur. In particular, Gen I suffer from one or more of the following limitations: (1) high temperatures; (2) low pressures; (3) exotic materials; (4) low power densities; (5) astronomical size; (6) difficult or expensive manufacture. Generation II eliminates or reduces shortcomings (1-5) but exacerbates (6). Generation III again sidesteps (1-5) and mostly resolves (6).⁹

CONCLUSIONS

Epicatalysis and supradegeneracy have been recognized as physical phenomena only in the last several years, but they could have been discovered 100-150 years ago, as could have many of their physical embodiments. In this sense, Gen III challenges are underwhelming; after all, they do not involve exotic materials or extreme thermodynamic conditions. In another sense, however, this is encouraging because they should not be overly difficult to explore; after all, many involve 19th-century technology and methods.

Science is littered with former laws: Newton's law of gravitation, law of mass action, conservation of mass, ideal gas law, Avogadro's, Boyle's, Charles's, Dalton's, Euler's, Fourier's, Gay-Lussac's, Ohm's, Kirchhoff's, Darcy's, Petit-Dulong, Curie's, Raoult's, Snell's, Stokes', and many more. Though still widely applicable, these laws are now understood to be merely handy approximations. Their demotions did not reduce their usefulness; rather, they cleared the way for more comprehensive, precise, and accurate descriptions of Nature. Newton's gravity, for instance, gave way to Einstein's general relativity; the ideal gas law was superceded by van der Waals equation; and conservation of mass was replaced by conservation of mass-energy. Perhaps it's time to reconsider the universality of the 19th-century's most famous law. Should Maxwell zombies fail, the domain of the second law is extended; should they succeed, new thermodynamic horizons appear. Win, lose, or draw, something surprising will be learned and new technologies and applications likely result.¹⁰ In the end, science proceeds by paradox, not dogma.¹¹

NOTES

- ¹ The canonical ensemble is considered here, but this discussion also applies to the microcanonical or grand canonical ensembles.
- ² By analogy, it is relatively easy to climb a tall building taking the stairs, while rather difficult to leap it in a single bound.
- ³ The e-folding distance for an ideal gas column on Earth is roughly 8.6 km, thus to attain suprathreshold gravitational energy (e.g., $E = mgz \approx 10kT$ with $T = 300$ K) would require a cone height of roughly 85 km, which is just shy of the von Karman line, the rough boundary between the atmosphere and space.
- ⁴ Real energy ladders will be capped by such things as the finite size and number of atoms in the system.
- ⁵ A number of natural systems (e.g., the hydrogen atom and other hydrogenic systems) narrowly avoid the supradegeneracy condition for reasons not understood, but currently under investigation.
- ⁶ The opportunities for lasing are so ubiquitous that it is said that strawberry jam (or a solution of it) could be made to lase.
- ⁷ This research is conducted in collaboration with Pacific Integrated Energy, San Diego, California, USA.

- ⁸ For example, in the ETD (Figure 1), the second law guarantees the operation of the heat engine by which its violation is consummated.
- ⁹ It is the opinion of this author that the ETD is the simplest, potentially highest power density, most versatile, and perhaps least expensive second law device yet devised.
- ¹⁰ Rarely do novel physical phenomenon (e.g., supradegeneracy, epicalysis) not result in new technologies or applications.
- ¹¹ It is hoped Bohr's dictum holds: "How wonderful that we have met with a paradox. Now we have some hope of making progress" (Moore, 1966).

ACKNOWLEDGMENTS

JSE Editor-in-Chief S. Braude is thanked for inviting this essay. The author gratefully acknowledges L. S. Schulman, M. W. Anderson, T. Herrinton, G. Levy, and J. Denur for insightful discussions. Crystal Ibarra is thanked for artistic support. The author thanks the two anonymous reviewers for insightful and constructive comments. This work was supported by The Laney Thornton Foundation and by a University of San Diego International Opportunity Grant (2019).

REFERENCES

- Attard, P. (2012). *Non-equilibrium thermodynamics and statistical mechanics: Foundations and applications*. Oxford University Press.
- Bauer, T. (2011). *Thermophotovoltaics: Basic principles and critical aspects of system design*. Springer.
- Bennett, C. H. (1982, December). The thermodynamics of computation – A review. *International Journal of Theoretical Physics*, 21(12), 905–940.
- C pek, V., & Sheehan, D. P. (2005). *Challenges to the second law of thermodynamics (Theory and experiment)*. Fundamental Theories of Physics Series 146. Springer.
- Chen, F. F. (1984). *Introduction to plasma physics and controlled fusion: Volume 1: Plasma physics* (2nd ed.). Plenum.
- Debye, P., & H ckel, E. (1923). The theory of electrolytes. *Physikalische Zeitschrift*, 24, 185–206.
- de Groot, S. R., & P. Mazur, P. (1984). *Non-equilibrium thermodynamics*. Dover.
- Denur, J. (2018). Epicalysis in a simple mechanical–gravitational system: A second-law paradox? *Journal of Thermodynamics and Catalysis*, 9. DOI:10.4172/2157-7544.1000200; researchgate.net/publication/334811479
- Dimitrijević, S. (2000). *Understanding semiconductor devices*. Oxford University Press.
- Dornhaus, R., Nimtz, G., & Schlicht, B. (1983). *Narrow-gap semiconductors*. Springer.

- Earman, J., & Norton, J. D. (1999). Exorcist XIV: The wrath of Maxwell's demon. *History and Philosophy of Modern Physics*, 29(4), 435–471; 30, 1.
- Eddington, A. S. (1935). *New pathways in science*. Cambridge University Press.
- Eisenberg, A., & Kim, J.-S. (1998). *Introduction to Ionomers*. Wiley.
- Garrett, W. R., Zhu, Y., Deng, L., & Payne, M. G. (1996). Multi-photon excitation through a resonant intermediate state: Unique separation of coherent and incoherent contributions. *Optics Communications*, 128, 66.
- Gaveau, B., & Schulman, L. S. (2009). Generalized Clausius relation and power dissipation in nonequilibrium stochastic systems. *Physics Review E*, 79(1), 021112.
- He, G. S., Markowicz, P. P., Lin, T. C., & Prasad, P. N. (2002). Observation of stimulated emission by direct three-photon excitation [Letter]. *Nature*, 415, 767–770.
- Ibach, H., & Lüth, H. (2009). *Solid-state physics* (4th ed.) Springer.
- Ichimaru, S. (1980). *Basic principles of plasma physics: A statistical approach*. Benjamin-Cummings.
- Kreuer, K. D. (2003). Proton-conducting oxides. *Annual Review of Materials Research*, 33, 333.
- Landauer, R. (1961). Irreversibility and heat generation in the computing process. *IBM Journal of Research and Development*, 5, 183–191. <http://dx.doi.org/10.1147/rd.53.0183>
- Lee, J. W. (2019). Electrostatically localized proton bioenergetics: Better understanding membrane potential. *Heliyon*, 4, e01961.
- Leff, H. S., & Rex, A. F. (2003). *Maxwell's demon 2: Entropy, classical and quantum information, computing*. Institute of Physics Publishing.
- Li, M., et al. (2015). Ultralow-threshold multiphoton-pumped lasing from colloidal nanoplatelets in solution. *Nature Communications*. DOI: 10.1038/ncomms9513
- Maxwell, J. C. (1872). *Theory of heat* (Chapter 12). Longmans, Green, and Co.
- McGill, T. C., & Collins, D. A. (1993). Prospects for the future of narrow bandgap materials. *Semiconductor Science Technology*, 8, S1.
- Mertens, K. (2014). *Photovoltaics: Fundamentals, technology and practice*. John Wiley.
- Milnes, A. G. (1973). *Deep impurities in semiconductors*. Wiley-Interscience.
- Milonni, P. W., & Eberly, J. H. (1988). *Lasers*. John Wiley & Sons.
- Moore, R. E. (1966). *Niels Bohr: The man, his science & the world they changed*. Knopf.
- Mouthaan, T. J. (1999). *Semiconductor devices explained: Using active simulation*. Wiley.
- Nelson, P. (2004). *Biological physics: Energy, information, life*. W. H. Freeman.
- Neudeck, G. W. (1989). *The PN junction diode* (2nd ed.). Addison-Wesley.
- Neumann, R. M. (1980). Entropic approach to Brownian movement. *American Journal of Physics*, 48(5), 354–357. <https://doi.org/10.1119/1.12095>
- Pathria, R. K. (1985). *Statistical mechanics*. Pergamon.
- Reif, F. (1965). *Fundamentals of statistical and thermal physics*. McGraw-Hill.
- Rogers, S. E., & Ubbelohde, A. R. (1950). Melting and crystal structure. III. Low-melting acid sulphates. *Transactions of the Faraday Society*, 46, 1051–1061. <https://doi.org/10.1039/TF9504601051>
- Saleh, B. E. A., & Teich, M. C. (1991). *Fundamentals of photonics*. John Wiley & Sons.
- Schroeder, D. V. (2000). *An introduction to thermal physics*. Addison Wesley Longman.

- Shannon, C. E. (1948, July, October). A mathematical theory of communication. *Bell System Technical Journal*, 27, 379–423, 623–656. <http://people.math.harvard.edu/~ctm/home/text/others/shannon/entropy/entropy.pdf>
- Sheehan, D.P. (1995). A paradox involving the second law of thermodynamics. *Physics of Plasmas*, 2(6), 1893–1898. <https://doi.org/10.1063/1.871276>
- Sheehan, D. P. (1996). Another paradox involving the second law of thermodynamics. *Physics of Plasmas*, 3(1), 104–110. <https://doi.org/10.1063/1.871834>
- Sheehan, D. P. (1998a, June). Four paradoxes involving the second law of thermodynamics. *Journal of Scientific Exploration*, 12(2), 303–314. https://www.scientificexploration.org/docs/12/jse_12_2_sheehan.pdf
- Sheehan, D. P. (1998b, June). Dynamically maintained steady-state pressure gradients. *Physical Review E*, 57(6), 6660–6666. <https://digital.sandiego.edu/cgi/viewcontent.cgi?article=1003&context=phys-faculty>
- Sheehan, D. P. (2001, February). The second law and chemically-induced, steady-state pressure gradients: Controversy, corroboration and caveats. *Physics Letters A*, 280(4), 185–190. [https://doi.org/10.1016/S0375-9601\(01\)00060-3](https://doi.org/10.1016/S0375-9601(01)00060-3)
- Sheehan, D. P. (Ed.) (2002, July). *First international conference on quantum limits to the second law*, San Diego, CA, July 28–31, 2002; *American Institute of Physics* 643.
- Sheehan, D. P. (Guest Ed.). (2007a). The second law of thermodynamics: Foundations and status. *Proceedings of AAAS Symposium*, June 19–22, 2006, University of San Diego, CA; Special Issue of *Foundations of Physics*, 37(12).
- Sheehan, D. P. (2007b, December). Thermosynthetic life. *Foundations of Physics*, 37(12), 1774–1797. <https://doi.org/10.1007/s10701-007-9168-y>
- Sheehan, D. P. (2008, December). Energy, entropy, and the environment (how to increase the first by decreasing the second to save the third). *Journal of Scientific Exploration*, 22(4), 459–480. https://www.scientificexploration.org/docs/22/jse_22_4_sheehan.pdf
- Sheehan, D. P. (2010). *Look mom, no batteries: Perpetual computing and the second law*. Technical presentations at Microsoft and Google.
- Sheehan, D. P. (Ed.). (2011). Second law of thermodynamics: Status and challenges. *Proceedings of symposium at 92nd Annual Meeting of Pacific Division of AAAS*, 14–15 June 2011, University of San Diego; *American Institute of Physics* 1411.
- Sheehan, D.P. (2013). Nonequilibrium heterogeneous catalysis in the long mean-free-path regime. *Physical Review E*, 88, 032125. <https://doi.org/10.1103/PhysRevE.88.032125>
- Sheehan, D. P. (2015, December). United States Patent, US 9,212,828, *Epicatalytic Thermal Diode*. U.S. Patent Office.
- Sheehan, D. P. (2018a, July–August). Maxwell zombies: Conjuring the thermodynamic undead. *American Scientist*, 106(4), 234–241. <https://doi.org/10.1511/2018.106.4.234>
- Sheehan, D. P. (2018b). Asymmetric van't Hoff equation and equilibrium temperature gradients. *Journal of Non-Equilibrium Thermodynamics*, 43(4), 301–315. <https://doi.org/10.1515/jnet-2017-000>
- Sheehan, D. P. (2019, December). Advancing photovoltaics and thermophotovoltaics with supradegeneracy. *Sustainable Energy Technologies & Assessment*, 36, 100539.

- Sheehan, D. P. (2020a). Thermal energy extraction and utilization using supra-degeneracy. U.S. patent pending.
- Sheehan, D. P. (2020b). Supradegeneracy and the second law of thermodynamics. *Journal of Non-Equilibrium Thermodynamics*, 45(2), 121–132. <https://doi.org/10.1515/jnet-2019-0051>
- Sheehan, D. P., & Gross, D. H. E. (2006, October 15). Extensivity and the thermodynamic limit: Why size really does matter. *Physica A*, 370(2), 461–482. <https://doi.org/10.1016/j.physa.2006.07.020>
- Sheehan, D. P., & Schulman, L. S. (2019, June 15). 'Population inversion' at equilibrium. *Physica A*, 524, 100–105. <https://doi.org/10.1016/j.physa.2019.03.022>
- Sheehan, D. P., & Welsh, T. M. (2019, February). Epically catalytic thermal diode: Harvesting ambient thermal energy. *Sustainable Energy Technologies & Assessments*, 31, 355–368. <https://doi.org/10.1016/j.seta.2018.11.007>
- Sheehan, D. P., Putnam, A. R., & Wright, J. H. (2002, October). A solid-state Maxwell demon. *Foundations of Physics*, 32(10), 1557–1595. <https://doi.org/10.1023/A:1020479302947>
- Sheehan, D. P., Wright, J. H., Putnam, A. R., & Perttu, E. K. (2005, October). Intrinsically biased, resonant NEMS-MEMS oscillator and the second law of thermodynamics. *Physica E*, 29(1–2), 87–99.
- Sheehan, D. P., Mallin, D. J., Garamella, J. T., & Sheehan, W. F. (2014, March). Experimental test of a thermodynamic paradox. *Foundations of Physics*, 44(3), 235–247. <https://doi.org/10.1007/s10701-014-9781-5>
- Sheehan, D. P., Zawlacki, T. A., & Helmer, W. H. (2016, July). Apparatus for testing gas–surface reactions for epically catalysis. *Review of Science Instruments*, 87(7), 074101. <https://doi.org/10.1063/1.4954971>
- Smets, A., Jge r, K., Isabella, O., Van Swaaij, R., & Zeman, M. (2016). *Solar energy: The physics and engineering of photovoltaic conversion technologies and systems*. UIT Cambridge.
- Sokolov, I. M. (2010, November). Statistical mechanics of entropic forces: Disassembling a toy. *European Journal of Physics*, 31(6), 1353–1367.
- Wang, Y. et al. (2014, May 14). Stimulated emission and lasing from CdSe/CdS/ZnS core-multi-shell quantum dots by simultaneous three-photon absorption. *Advanced Materials*, 26, 2954–2961.
- Xing, G., et al. (2012). Ultralow-threshold two-photon pumped amplified spontaneous emission and lasing from seeded CdSe/CdS nanorod heterostructures. *ACS Nano*, 6(12), 10835–10844.
- Yeung, R. W. (2002). *A first course in information theory*. Kluwer Academic/Plenum.
- Zhang, F.-D., et al. (2019, September). Dynamic properties of ultrashort two-photon pumped transient cavityless lasing in a Coumarin-dye solution. *Journal of Optics*, 21(10), 105502. <https://doi.org/10.1088/2040-8986/ab3e23>
- Zheng, Q., et al. (2013, March). Frequency-upconverted stimulated emission by simultaneous five-photon absorption. *Nature Photonics* 7, 234–239. <https://doi.org/10.1038/nphoton.2012.344>
- Zwanzig, R. (2001). *Nonequilibrium statistical mechanics*. Oxford University Press.

HISTORICAL PERSPECTIVE

Dissociation and the Unconscious Mind: Nineteenth Century Perspectives on Mediumship

CARLOS S. ALVARADO

Parapsychology Foundation
carlos@theazire.org

Submitted December 18, 2019; Accepted March 21, 2020; Published September 15, 2020

<https://doi.org/10.31275/20201735>

Creative Commons License CC-BY-NC

Abstract There is a long history of discussions of mediumship as related to dissociation and the unconscious mind during the nineteenth century. After an overview of relevant ideas and observations from the mesmeric, hypnosis, and spiritualistic literatures, I focus on the writings of Jules Baillarger, Alfred Binet, Paul Blocq, Théodore Flournoy, Jules Héricourt, William James, Pierre Janet, Ambroise August Liebeault, Frederic W. H. Myers, Julian Ochorowicz, Charles Richet, Hippolyte Taine, Paul Tascher, and Edouard von Hartmann. While some of their ideas reduced mediumship solely to intra-psychic processes, others considered as well veridical phenomena. The speculations of these individuals, involving personation, and different memory states, were part of a general interest in the unconscious mind, and in automatism, hysteria, and hypnosis during the period in question. Similar ideas continued into the twentieth century.

Keywords: mediumship; dissociation; secondary personalities; Frederic W. H. Myers; Théodore Flournoy; Pierre Janet

INTRODUCTION

Dissociation, a process involving the disconnection of a sense of identity, physical sensations, and memory from conscious experience, has been related to mediumship due to the latter's sensory and motor automatism and changes of identity. In recent years there have been some conceptual discussions of dissociation and mediumship (e.g., Maraldi et al., 2019) as well as empirical studies exploring their

relationship (e.g., Vencio, et al., 2018). This is not a new interest, as seen in my discussion below of speculations and observations about dissociative aspects of mediumship during the nineteenth century. Considering some of this material has generally been forgotten by current mediumship and dissociation researchers, and that some of it has not been translated into English, my purpose in this article is to make the content of these writings more available, and to provide some historical context to current ideas on the subject with additional references, several of which appear in Notes.¹

Readers should be aware that most of the discussions about the topic during the nineteenth century were attempts to reduce mediumship to psychological, physiological, and medical ideas. In addition, much of what I discuss as examples of dissociation was not seen as such by believers in the spiritual interpretation of mediumship.

DISSOCIATION DURING THE NINETEENTH CENTURY

Trances and Secondary Personalities

The concept of dissociation and of hidden levels of the mind was widely discussed throughout the nineteenth century in relation to manifestations such as amnesia, somnambulism, and secondary personalities appearing spontaneously or via hypnosis, and specific features such as state-specific memories (Crabtree, 1993; Gauld, 1992). For example, natural somnambulism, or sleepwalking, was discussed by many (e.g., Abercrombie, 1838; Bertrand, 1823; Macario, 1857; Prichard, 1835), and several cases were presented during the period (e.g., A., 1869; Abercrombie, 1838, pp. 296–298; Chambard, 1879; Moore, 1870). One of them was of a medical student who, in addition to having seen a patient,

played the piano, played cards, and did anatomical drawings while he was in his somnambulistic state (A, 1869).

Many cases of somnambulistic behavior became well-known, such as that of American Rachel Baker (born 1794) (Figure 1), who preached to audiences about moral and religious topics with no recollection of her actions



Figure 1. Rachel Baker, sleeping preacher (Smith, 1837)

(Figure 1). “This modest damsel,” wrote a commentator about her case, “falls into a devotional exercise as soon as she loses her consciousness” (Mais, 1814, p. 6). Interestingly, other cases of somnambulistic speakers were also reported during the nineteenth century (e.g., Belden, 1834; Mitchell, 1876).²

This was part of a long history of examples of “inspired,” “entranced,” or “somnambulistic” revelations about all kinds of topics, but particularly moral, philosophical, religious, and spiritual ones. Such cases came from antiquity and are to be found in the literatures of mesmerism, possession, religious movements, Spiritualism, trance, and other topics (e.g., Baxter, 1833; Casaubon, 1655; Gauthier, 1842; Oesterreich, 1930), which have also been discussed in more recent times (e.g., Crabtree, 1993; Garrett, 1987; Gauld, 1992; Taves, 1999). Examples of these “revelations” were the discourses of visionary and magnetic patient Friederike Hauffe (1801–1829) (Kerner, 1845), the mesmeric subject Emma (Haddock, 1851), and the well-known clairvoyant Andrew Jackson Davis (1826–1910) (Davis, 1847).

The mesmeric literature, embedded in the theoretical concept of animal magnetism, presented many examples of the induction of magnetic somnambulism. This was generally described as similar to sleep in some aspects:

If his magnetizer speaks to him he responds without waking up; he can even perform various movements, and when he returns to the natural state he retains no memory of what has happened. His eyes are closed, he usually hears only those who have been put in rapport with him. The external organs of his senses are all, or almost all, dormant, and yet he feels sensations, but by some other means. (Deleuze, 1825, p. 98)
[This, and other translations, are mine.]

The state was interpreted by a writer to be one in between sleep and wakefulness (Gauthier, 1845, p. 566), while another mesmerist stated that it sometimes seemed to be a nervous disturbance, but in other occasions it appeared as a tranquil sleep (Charpignon, 1848, p. 67). English chemist and physician William Gregory (1803–1858) wrote in his *Letters to a Candid Inquirer, on Animal Magnetism* that: “The state

of somnambulism is not a true sleep, but a state in which ordinary vision is cut off, while the mind is, in other respects, not only awake, but, intellectually and morally, more active than usual . . ." (W. Gregory, 1851, p. 57).

Magnetic somnambulism, as seen in historical treatises (Crabtree 1993; Gauld 1992), was associated with phenomena such as thought-transference, clairvoyance, healing, pre-vision of future events, and other occurrences. This is what German philosopher Carl du Prel (1839–1899) referred to as "new faculties, new connections with nature, in apparent contradiction with all the laws of physiology" (du Prel, 1907, p. 62).

Dissociative phenomena were discussed and observed as well by the mesmerists. Some of these reports can be found before the nineteenth century, such as Armand Marie Jacques de Chastenet Puységur's (1751–1825) *Mémoires pour Servir à l'Histoire et à l'Établissement du Magnétisme Animal*. Here he presented his now classic observations of Victor Race, a peasant he magnetized to treat his ailments. Described as quiet and shy, Race changed when magnetized. He became outspoken, and very friendly, "his heart poured out; . . . as if it was filled with friendship & gratitude . . ." (Puységur, 1784, p. 36).

French mesmerist Joseph Philippe François Deleuze (1753–1835) noticed that during the mesmeric state a person could recover the "recollection of things that were forgotten during wakefulness" (Deleuze, 1813, p. 176), leading him to postulate the existence of separate beings. Another interesting case was the patient Estelle L'Hardy, who showed various changes in the magnetic state (Despine, 1840). In addition to an apparent secondary personality and visions of someone called Angeline (among others), who "served as a guide to the patient" (p. 35), it was recorded that some of these changes were: "The remarkable development of intelligence, memory, imagination, and of all physical and moral faculties . . ." (Despine, 1840, p. 40).

Another mesmerist reported the case of a "magnetized" woman who referred to herself using a different name than usual, saying she was a different individual (Lang, 1843, pp. 95–96, 108). In addition, there were occasional reports of communications from the deceased (e.g., Lausanne, 1816, pp. 12–14). Louis Alphonse Cahagnet (1809–1885) presented many accounts of the spiritual world and of encounters

with spiritual entities narrated by his mesmerized subjects in his *Magnétisme: Arcanes de la Vie Future Dévoilés* (Cahagnet 1848–1854; see also Haddock, 1851). Such accounts were believed by some to be the result of the influence of the magnetizer's interests and the somnambule's imagination (Sandby, 1850).³

Reminiscent of dissociative effects, mesmeric procedures could make people insensitive to pain, as seen in cases of amputations and removal of teeth (Elliotson, 1843; Esdaile, 1847). An interesting testimonial came from English writer of literature and social topics Harriet Martineau (1802–1876), who had a disease that caused her much pain that was alleviated by the use of opiates. She wrote in her book *Letters on Mesmerism* (Martineau, 1845) that once, when magnetized, she felt “a delicious sensation of ease spread through me, a cool comfort, before which all pain and distress gave way, oozing out, as it were, at the soles of my feet” (p. 9).

Persons in the magnetic state have been described as forgetting events during their trance, but remembering them later during another magnetic induction. In this situation, according to Gregory, the person “lives . . . a distinct life in the sleep, and has . . . a double or divided consciousness” (W. Gregory, 1851, p. 82).

In addition to mesmeric procedures, later explorers of hypnosis were able to document the existence of state-specific memories during their observations (e.g., Gurney, 1884). Some changes took place under hypnosis, as in the case of a woman named Lucie. When she was hypnotized it was noticed that the idea that appeared in her consciousness after a sudden awakening is not the recollection of somnambulism, it is the next part of the act started and interrupted during wakefulness. It is as if somnambulism never existed and the two waking moments seem to join. In the middle of a conversation L. was asleep before she could finish her phrase. After a quarter of an hour of sleep she woke up and calmly finished the conversation started without doubting that she had slept (Janet, 1886, p. 579).

So-called personalities were also induced through suggestion (Richet, 1883), leading to the speculation that suggestion could produce in the hypnotized a “dissociation of their psychic elements” (p. 233). This was sort of the illusion of being a different person, while maintaining their sense of self, which could disappear with a deeper

hypnotic state. The process not only involved affecting recollections, but also an overstimulation of the person's imagination. Similarly, it was argued that suggestion could induce ideas of spiritual agency during automatic writing (e.g., Barkworth, 1891, p. 24).

This was part of an interest by the end of the nineteenth century on conducting psychology from an empirical perspective, as compared to philosophical speculations. Much of this took place, particularly in France, in studies of pathology of memory and other phenomena using the single case study approach (Carroy & Plas, 1996; Foschi, 2003; Lombardo & Foschi, 2003). It was assumed that much could be learned about the normal aspects of human beings by the study of their abnormalities (e.g., Ribot, 1885). The emphasis on pathology was the province of the work of individuals such as Jean-Martin Charcot (1825–1893) and Pierre Janet (1859–1947) (Bourneville, 1886; Janet, 1889). Others had a less pathologically oriented outlook, but still maintained that the induction of unusual mental states by hypnosis could illuminate the workings of the mind (e.g., Beaunis, 1885; Myers, 1886). As stated at the time, “throwing the mental machinery slightly out of gear” allows us to “discern the secrets of its adjustment” (Gurney & Myers, 1885, p. 422).

Furthermore, much was learned about dissociation from those who studied motor automatisms (e.g., Binet, 1890; Binet & F r , 1887; James, 1889; Janet, 1889), and from cases of spontaneous secondary personalities. The latter included the cases of Mary Reynolds (1793–1854; Mitchill, 1817), F lida X. (born 1843) (Azam, 1887), Ansel Bourne (born 1826) (Hodgson, 1891), and Mollie Fancher (1848–1916) (Dailey, 1894), among many others (e.g., Bourru & Burot, 1888; Dewar, 1823; Mason, 1893; Mayo, 1847, Chapter 18).⁴



Figure 2. Léonie Leboulanger

Some interesting observations of these personalities were those conducted under hypnosis with Léonie Leboulanger (born 1837) in France (Figure 2). When first hypnotized Léonie adopted the name Léontine, who claimed she was not Léonie:

This new character, L onie 2, claims to have all the sensations and all the actions, in a word, all the psychological phenomena she has been conscious of during somnambulism . . . ; she attributes the opposite to L onie 1, that is, to the normal awake person, all phenomena that have been conscious during wakefulness. (Janet, 1889, p. 132)

Cases of this sort, as well as many of the phenomena of hysteria and hypnosis, led some to speculation about the “doubling” of conscious thoughts. This, in the words of a student of the subject, suggested the existence of other aspects of the self “each of which may have its perceptions, its memories, and even its moral character” (Binet, 1891, p. 839). Furthermore, “there may exist successions of . . . intelligent, self-conscious operations that are accomplished without our help and even without our knowledge” (Binet, 1891, p. 855).

Eventually all of these phenomena, and others such as dreams, imagination, and memory, contributed to support the notion of the existence of non-conscious regions of the mind, and of dissociation. This was frequently discussed during the late nineteenth century in works such as *On Double Consciousness* (Binet, 1890), *Das Doppelich* (Dessoir, 1890), *L'Automatisme Psychologique* (Janet, 1889), *The Psychology of Suggestion* (Sidis, 1898), as well as in influential articles (e.g., James, 1890a; Prince, 1890).

These investigations coincided with the development of psychical research in the nineteenth century, as seen in countries such as Italy (Biondi, 1988), England (Gauld, 1968), the United States (Moore, 1977), France (Plas, 2000), and Germany (Wolffram, 2009). There is scholarly work showing that some of the studies of the unconscious mind, and the process of dissociation, not only took place within psychical research work, but that psychical research contributed to the development of these ideas (Alvarado, 2002; Crabtree, 1993; Plas, 2000). This was particularly the case in the study of mediumship, a phenomenon that played a central role in the development of Spiritualism in the nineteenth century (e.g., Cox, 2003; Edelman, 1995; Podmore, 1902), and that was pathologized by many students of the topic (Janet, 1889; Marvin, 1874).⁵

Mediumship

References to mediums include the assertion that they were “simply incomplete somnambules” (Perrier, 1854, p. 79), that they were “possessed with certain dominant ideas” (Carpenter, 1853, p. 547), that they showed a “mixed state” they were not aware of (Lafontaine, 1860, p. 31), and that trance made them automatons, liable to produce unconscious reflex actions (Beard, 1879).

Lawyer Andr -Saturnin Morin (1807–1888) wrote in *Du Magn tisme et des Sciences Occultes* that mediums had, like mesmeric somnambulists,

a mental state different from the waking state, and at times his opinions, his feelings, are seriously modified, so it is no wonder that the language he addresses the table with, bears a particular character that does not seem to belong to the person of the medium. (Morin, 1860, p. 368)

In this state, Morin assured us, it is not possible to distinguish if thoughts came from within or from outside the medium.

Another writer referred to suggestion bringing out the medium’s “submerged personality” (Somers, 1893, p. 322). Others shared the belief that suggestion could condition the medium’s subconscious mind to assume the shape of communications from the dead (e.g., Ermacora, 1893, pp. 42–43; Hudson, 1893, p. 213). This was the case even if the phenomena were veridical, a topic further discussed below.

American Judge John W. Edmonds (1799–1874), a medium himself, noticed that mediums sometimes were unaware that they were writing and knew nothing of the content of the written message (Edmonds, 1860). This was the case of Edmond’s friend and writing medium, American physician George T. Dexter (Edmonds & Dexter, 1853, p. 93), and of later mediums (e.g., Flournoy, 1900, p. 5; Myers, 1902, p. 70). Other variants of the experience of mediums witnessed by Edmonds were being conscious but with no control, and cases “when the medium was in the full possession of consciousness and volition, and yet was uttering the thoughts of an intelligence not his own” (Edmonds, 1860, p. 62). In fact, not every medium was entranced. As American reverend and spiritualist Samuel B. Brittan (circa 1815–1883)

noticed, while performing many mediums are in their usual mental states, some “write letters and converse on subjects altogether foreign to the manifestations” (Brittan & Richmond, 1853, p. 72).

The famous medium D. D. Home (1833–1886) described his experience of trance as follows:

I feel for two or three minutes in a dreamy state, then I become quite dizzy, and then I lose all consciousness. When I awake I find my feet and limbs cold, and it is difficult to restore the circulation . . . I have no knowledge on my own part of what occurs during the trance. (London Dialectical Society, 1871, p. 188)

There are also accounts of Home behaving as if he were possessed by a spirit (e.g., L. M. Gregory, 1866). In one of them it was stated:

All who have seen Mr. Home in this state of trance, are aware how clearly he sees and communicates with spirits . . . The gestures, the most trivial actions of bodily life, the mode of walking and speaking, the voice, the infirmities of persons who have passed away long before he was born, and concerning whose peculiarities in all these particulars Mr. Home had not the least possible means of obtaining any knowledge, are all repeated by him when in this state with an accuracy of detail which leaves no doubt, either that he is at the moment possessed by the spirit whose earthly characteristics he is delineating, or that he is receiving from them or from other spirits impressive communications which enable him to reproduce them. (D., 1867, p. 112)

Such experiences could vary, showing various degrees of trance (an ill-defined concept), and the production of phenomena without apparent alteration of consciousness (Edmonds, no date). There were even a few accounts showing awareness during trance (e.g., Hill-Tout, 1895).

An interesting introspective account about trance lectures comes from English medium and author Emma Hardinge (1823–1899), who

stated in *Six Lectures on Theology and Nature* that when she talked to audiences inspired by spirits:

There is an absolute compulsion to perform a certain part, whilst I retain sufficient consciousness to appreciate and hopelessly to struggle against the control exercised. In these spiritual lectures I can equally clearly recognize the presence of psychological control. The unprompted flow of words is not my own. Every gesture and movement appears to me, at times, compelled, and yet the compulsion is accompanied by a dreamy indifference on my part, a perfect absence of care, and sense of safety and protection from my precious invisible masters, that renders my servitude an exceedingly happy one . . . The details of my addresses I can only realize very imperfectly at the time, my own state being too dreamy for acute perception. (Hardinge, 1860, pp. 11ñ12)

Another account, this one about automatic writing, showed no awareness of the process. For example, the above-mentioned writing medium George T. Dexter wrote: “Let it also be understood that the spirit-manifestation by my arm is absolutely involuntary. I have no direction in the act. My muscles are the medium of spirit-communication, not my thought . . .” (Edmonds & Dexter, 1853, p. 89).

One writer referred to common characteristics of the secondary mediumistic personalities. In addition to claims to be a spirit, the list included suggestibility, eloquence, enhanced memory and imagination, and a propensity for vulgarity and profanity (by no means universal), and there was “a certain faculty of lucky or supernormal perception” (Patrick, 1898, p. 559), something the writer was skeptical of.

Much was written about veridical information obtained through mediums, which did much to sustain the belief in the reality of spirit communication (e.g., Cridge, 1854, Chapter 8; Moses, 1879). Physician William Gregory, said that although mediums believed that their communications came from spirits of the dead, he thought that “being more or less somnambulists and lucid, these answers come from their own intelligences, but without any consciousness of this fact” (W. Gregory, 1856, p. 320). Another defender of living agency was physician



Figure 3. Leonora E. Piper

Carl Gustav Carus (1789–1869), who said in *Über Lebensmagnetismus* (1857) that mediumistic communications were phenomena that source the medium’s unconscious divining powers (Carus, 1857).

The veridical trances and behavior changes of American medium Leonora E. Piper (1857–1950) (Figure 3) were particularly influential (e.g., Hodgson, 1892, 1898; James, 1886; Lodge, 1890).⁶ One of her investigators wrote:

The personality active and speaking in the trance is apparently so distinct from the personality of Mrs. Piper that it is permissible and convenient to call it by another name . . . It strikes one as a different personality altogether, and the name by which it introduces itself when asked, viz., “Dr. Phinuit,” is as convenient as any other . . . and can be used wholly irrespective of hypothesis . . . At the same time the name is useful as expressing compactly what is naturally prominent to the feeling of any sitter, that he is not talking to Mrs. Piper at all. The manner, mode of thought, tone, trains of idea, are all different. You are speaking no longer to a lady but to a man, an old man . . . (Lodge, 1890, p. 448)

Changes of behavior consistent with the identity of spirit communicators were observed with many mediums. In the opinion of an early author, automatic actions in the brain could allow a medium to “assume any personality, from that of a divinity to that of a toad” (Rogers, 1853, p. 171). In one case a medium “was first controlled by an influence which purported to be the spirit of Pocahontas, during which she combed her hair down upon her shoulders, and assumed the actions and even the physiognomy of an Indian woman, and sang what appeared to be an Indian song” (Anonymous, 1854, p. 202). Another example with the medium Emma Jay, recorded in the well-known book *From Matter to Spirit*, was the observation that “her voice and manner differed much when under different influences” (De Morgan, 1863, p. 90).⁷

Those types of observations led Russian Alexander Aksakof (1832–1903) to discuss the “doubling of consciousness” as a fundamental phenomenon of mediumship (Aksakof 1895/1890, p. xxiv). This included the phenomenon of personation, which shows the “duality of the psychic being” (p. xxiv) presenting an unconscious life. In mediumship and other phenomena, this author stated, the self “can have a multiple character normal, abnormal, or fictional according to the conditions of the organism (natural sleep, somnambulism, mediumship)” (p. xxiv).

This has led to many discussions about the topic. Among them, those concerning the similarities between secondary personalities in non-mediumistic cases and the communicators and controls manifested by mediums (e.g., Leaf, 1890, p. 567).

Also relevant to the concept of dissociation in mediumship were various ideas of unconscious action in mental and physical mediumship, including the reality of the manifestations, and which were akin to the concept of unconscious cerebration (e.g., Lum, 1873; Rogers, 1853). In addition, there were ideas of unconscious muscular action to account for table turning (e.g., Braid, 1853; Faraday, 1853).⁸

FURTHER EXAMPLES OF DISCUSSIONS OF MEDIUMSHIP AND DISSOCIATION

Paul Tascher

The topic was discussed in Paul Tascher’s (1855) *Seconde Lettre de Grosjean sur le sujet de Tables Parlantes, des Possessions, des Sibylles, du Magnétisme et Autres Diableries*, published anonymously under the pseudonym Gros Jean. Tascher’s ideas have been popularized by later authors (e.g., Crabtree, 1993, pp. 264–265; Janet, 1889, Part 2, Chapter 3, Section 4). He believed that in adolescence, and in the case of young girls, there may be a separation of the action of the will on the body, affecting sensibility and recollections, which could be manifested in mediumistic ways. He wrote about table turning and mediumship and listed five stages of the process.

In the first stage, Tascher wrote, the will and the sense of self were not separated. This separation commenced in the second stage in which the young person’s will started to separate from the mind and the body, and could act without willful action (automatism). Writing,

speech, and movements of the table (with contact) started to take place in the third stage: “The girl knows the answer that forms in her intellect, but she knows it as if it did not come from her: Attention is engaged, but without establishing the link between the mind and the self” (p. 11).

Finally, Tascher wrote about the fourth stage:

The girl has no internal knowledge of the response that is made in her mind, apart from the self; she does not know that as the movements of the table take place: the mental division is complete.

At the same time dissenting thoughts increase their domain. It is no longer a question addressed to the table, to the contrary she spontaneously interrogates one or other of the persons present . . . distant recollections are revealed without the girl’s awareness, romantic inventions, sentimental fantasies, ramblings [are produced] . . . (Tascher, 1855, pp. 10–11)

Jules Baillarger

Other interesting comments were authored by French physician Jules Baillarger (1809–1890) (Figure 4), well-known for his studies of mental illness and one of the founding members of the Société Médico-Psychologique (Ritti, 1891). His short comments were published in the *Annales Médico-Psychologiques* in the context of a presentation made at the aforementioned society on February 27, 1860, in which it was assumed that mediumistic practices could lead to mental illness, an idea shared by many French psychiatrists (Le Mal fan, 1999).



Figure 4. Jules Baillarger

Baillarger wrote about a woman who believed she was in contact with her deceased daughter, to whom she spoke continuously. The lady claimed the daughter guided her. According to Baillarger: “There is a doubling of personality similar to that which occurs during a dream; a fraction belonging to the individual, it seems there is another outside her” (Baillarger, 1861, p. 93).

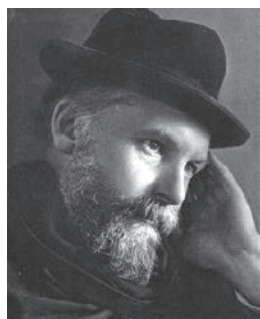
Hippolyte Taine

French historian and critic Hippolyte Taine (1828–1893) (Figure 5) is by all accounts an important figure in the development of positivistic approaches to knowledge in nineteenth century France (Nias, 1999). In his book *De l'Intelligence* (1878), he referred to a person's internal dialogue and abolition of the senses and of functions. Furthermore, Taine stated:



Figure 5. Hippolyte Taine

In this respect, the *spiritist* manifestations themselves put us on the path of discovery, showing us the coexistence at the same time, in the same individual, of two thoughts, two wills, two different actions, one of which is conscious, the other of which he is unaware of and which he attributes to invisible beings. The human brain is then a theatre in which different plays are performed at the same time . . . Nothing is more worthy of study than this basic plurality of the self; it goes much further than we imagine. I have seen a person who, [while] talking, singing, wrote, without looking at the paper, phrases and even entire pages, without been aware of what she wrote. In my eyes, her sincerity is perfect: She says that after the last page she has no idea of what she has written on the paper; when she reads it, she is surprised, sometimes alarmed. The writing is different from her ordinary writing. The movement of the fingers and the pencil is stiff and seems automatic. The writing always ends with a signature, that of a dead person, and bears the imprint of intimate thoughts, of a mental background that the author does not want to disclose. Certainly we observed a *doubling* of the self, the simultaneous presence of two series of parallel and independent ideas, two centers of action . . . juxtaposed in the same brain, each with its own work and each with different work, one on stage and the other behind the scenes, the second as complete as the first, since, alone and out of sight of each other, they build ideas followed and linked with phrases and related sentences which the other has no part of. (Taine, 1878, pp. 16–17)



Frederic W. H. Myers

An example of an influential theorist, mainly in psychical research, but also in psychology, was classical scholar Frederic W. H. Myers (1843–1901) (Figure 6).⁹ In his view, there were a variety of states and conditions affecting the threshold between the conscious and unconscious (or subliminal) regions of the mind.

These included dreams, hypnosis, hysteria, mediumistic trance, natural somnambulism, and some medical conditions, which could “afford examples of the development of what I have called secondary mnemonic chains, fresh personalities, more or less complete, alongside the normal state” (Myers, 1888, p. 387).

Myers wrote about automatic writing stating, that there were many cases in which the person produced writing without being aware of its content. On occasion, “the involuntary movement of the pen is altogether puzzling to the writer, is something which he has to make out with difficulty as if it were the product of another brain . . .” (Myers, 1884, p. 226; see also Myers, 1885).

In Myers’ view the trance utterances of medium Mrs. Piper were automatisms “which occur in sane subjects without entering the normal waking consciousness or forming part of the habitual chain of memory” (Myers, 1890, p. 437). It was for him, as he wrote in his well-known work *Human Personality and Its Survival of Bodily Death* (1903), an extreme case of automatism affecting “the whole psychical area; where a secondary consciousness not only crops up here and there through the primary, but for a time displaces it; where, in short, the whole personality appears to suffer intermittent change” (Myers, 1903, Vol. 2, p. 237).

Possession in mediumship, Myers (1903) believed, was akin to apparent possession by one own’s subliminal self, as seen in some cases of creativity and hypnotic secondary personalities. In this way Myers saw a continuity of the action of the subliminal mind and dissociation that was not limited to mediumship.

While Myers accepted spirit communication via mediumship

(e.g., Myers, 1902), he believed that, even with the best mediums, not all trances came from spirits, and that the medium's mind could interact with spiritual influence. He wrote: "I think that the depth of the trance has varied greatly on different occasions, and that sometimes the subliminal self of the sensitive is vaguely simulating, probably in an unconscious dream-like way, an external intelligence" (Myers, 1903, Vol. 1, p. 205). Such dynamics of the subliminal accounted for the mixed source of messages, which could be further complicated, Myers thought, by the content of the medium's supraliminal (conscious) mind. Furthermore, Myers (1903, Vol. 2, p. 250) conceived of "a kind of mixed telepathy between the sitter, the sensitive's spirit, and the extraneous spirit," which could appear during the same s ance.¹⁰

In addition, Myers also observed varieties in the trance and behaviors of Mrs. Piper during s ances. The spirit control "Phinuit" sometimes was fairly quiet. At times no veridical information was given, while at other times it seemed to flow freely. Also:

The trances could not always be induced at pleasure. A state of quiet expectancy would usually bring one on; but sometimes the attempt altogether failed. The trance when induced usually lasted about an hour, and there was often a marked difference between the first few minutes of a trance and the remaining time. On such occasions almost all that was of value would be told in the first few minutes; and the remaining talk would consist of vague generalities or mere repetitions of what had already been given (Myers, 1903, Vol. 2, p. 239).

Eduard von Hartmann

In Germany philosopher Eduard von Hartmann (1842ñ1906) (see Treitel, 2004, pp. 13ñ15, 21ñ22) believed that mediums had a "a certain disorganization of the nervous system; that is, the lower and the middle nerve centres are too independent of the highest, reflex-prohibiting centre of consciousness self control; they are, in other words, . . . hysterical . . ." (von Hartmann, 1885, p. 406). Mediums, according to him, showed two forms of somnambulism, an automatic one, with no

intelligence, and an intelligent one.

The somnambulistic consciousness, he believed, had a tendency to form personalities. “A medium in the somnambulistic state can play the part of a spirit and do things of which afterwards, when awake, he knows nothing, and which from the reports of the witnesses he must take for immediate spirit actions” (von Hartmann, 1885, p. 5).

This could involve veridical information. But according to von Hartmann these unconscious processes could also guide physical mediumship via the exteriorization of the medium’s nervous forces.¹¹ In his view:

This liberation of directive radiation of nerve force is under all circumstances . . . not a function of those parts of the brain which serve as support to the conscious will, but of deeper-lying layers of the brain which either coincide with those supporting the somnambulatory consciousness, or are more approximate to them than to the first. (von Hartmann, 1885, p. 442)

Charles Richet

The famous physiologist Charles Richet (1850–1935) (Figure 7) was also well-known during the nineteenth century for his work in psychological research, particularly his studies of what we would refer to today as ESP (e.g., Richet, 1884, 1889) (on Richet, see Alvarado, 2019a, and S. Wolf, 1993). In the 1884 article, the classic “La Suggestion Mentale et le Calcul des Probabilités,” he wrote about mediumship and dissociation, expressing his belief that



Figure 7. Charles Richet

all the intelligent manifestations attributed to the spirits are due to an individual that is unconscious and active at the same time. In addition, he is surprised by everything produced; because he is ignorant of the intellectual operations he performs, which are translated into action, and are not less removed from his awareness. (Richet, 1884, p. 650)

Richet stated that some individuals could perform actions without conscious awareness. The medium, he thought, was a person “who has the ability of *hemisomnambulism* or *partial unconsciousness*, an ability by which a part of his intelligence, his memory, his will, operates outside of awareness, however, consciousness remains quite awake” (Richet, 1884, pp. 650ñ651).

In a later paper, entitled “Les Mouvements Inconscients,” Richet said that in mediums

two states succeed each other and are mixed, that is, regular normal consciousness persists at the same time as another consciousness appears, coinciding with it without mixing, performing acts exempted from the first normal consciousness, and continuing, without the aid of the normal consciousness, a series of logical developments. It is therefore *hemi-uncon-sciousness*, or *hemi-somnambulism*. (Richet, 1886, p. 93)

Richet eventually defended the reality of veridical mediumship, as I point out at the end of this paper.

William James

American psychologist and philosopher William James (1842ñ1910) (Figure 8), well-known for his interest in psychic phenomena, also contributed to the study of mediumship (Alvarado, 2016; Knapp, 2017). Writing in *Scribner's Magazine*, James (1890a) summarized the work of French researchers on dissociative states. In his view trances were not necessarily pathological and were far from understood. He wrote: “A *comparative study of trances and sub-conscious states* is meanwhile of the most urgent importance for the comprehension of our nature” (W. James, 1890a, p. 373).

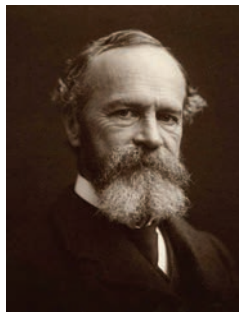


Figure 8. William James

When James discussed automatic writing in his *Principles of Psychology*, he stated:

The lowest phase of mediumship is automatic writing . . . Inspirational speaking, playing on musical instruments, etc., also belong to the relatively lower phases of possession, in which the normal self is not excluded from conscious participation in the performance, though their initiative seems to come from elsewhere. In the highest phase the trance is complete, the voice, language, and everything are changed, and there is no after-memory whatever until the next trance comes. (W. James, 1890b, pp. 393–394; see also W. James, 1889)

Also in *Principles*, James considered the similarities between many spirit communications and wondered if “sub-conscious selves are peculiarly susceptible to a certain stratum of the Zeitgeist, and get their inspiration from it,” something which “is obviously the case with the secondary selves which become ‘developed’ in spiritualist circles” (W. James, 1890b, p. 394). Nonetheless, he was not willing to explain all the content of communications using that explication.¹²

In various papers, James (1886, 1890c, 1909) reported his observations of medium Leonora E. Piper, who eventually convinced him her mentation could be veridical. He wrote that he was “as absolutely certain as I am of any personal fact in the world that she knows things in her trances which she cannot possibly have heard in her waking state, and that the definitive philosophy of her trances is yet to be found” (W. James, 1890c, pp. 658–659). But James also wrote that, regardless of showing good memory of previous communications, “Phinuit,” the medium’s spirit control, appeared to him to be fictitious. On occasion, James complained, he produced “tiresome twaddle” (W. James, 1890c, p. 656).

The importance of James’ (1886) earlier Piper report has been pointed out elsewhere (Alvarado, 2016). In addition to being the first scientific study of a mental medium (and of Piper) published, this was a call for the study of special individuals,¹³ and an example of the innovative use of stenographic records for that purpose. More relevant

for the topic of dissociation, James paid attention to the features of Piper's trances (which unfortunately he did not describe in the report), and used hypnosis to study them.

Regarding hypnosis, James (1886) wrote about his modest results:

My first two attempts to hypnotize her were unsuccessful. Between the second time and the third, I suggested to her "Control" in the medium-trance that he should make her a mesmeric subject for me. He agreed. (A suggestion of this sort made by the operator in one hypnotic trance would probably have some effect on the next.) She became partially hypnotized on the third trial; but the effect was so slight that I ascribe it rather to the effect of repetition than to the suggestion made. By the fifth trial she had become a pretty good hypnotic subject, as far as muscular phenomena and automatic imitations of speech and gesture go: But I could not affect her consciousness, or otherwise get her beyond this point. Her condition in this semi-hypnosis is very different from her medium-trance. The latter is characterized by great muscular unrest, even her ears moving vigorously in a way impossible to her in her waking state. But in hypnosis her muscular relaxation and weakness are extreme. She often makes several efforts to speak ere her voice becomes audible; and to get a strong contraction of the hand, for example, express manipulation and suggestion must be practised. The automatic imitations I spoke of are in the first instance very weak, and only become strong after repetition. Her pupils contract in the medium-trance. Suggestions to the "Control" that he should make her recollect after the trance what she had been saying were accepted, but had no result. In the hypnotic-trance such a suggestion will often make the patient remember all that has happened. (W. James, 1886, pp. 105-106)¹⁴

While Piper showed some evidence of veridical communications that impressed James, she was not consistently successful in thought-transference tests conducted in her normal state, during hypnosis, or during her mediumistic trance.

In a later publication by James (1909), “Report on Mrs. Piper’s Hodgson-Control,” he presented more examples of trances and communications via Piper by the presumed personality of Richard Hodgson (1855–1905), one of the medium’s main investigators while he was alive. Referring to Rector, a later spirit control, he wrote:

He appears like an aged and, when he speaks instead of writing, like a somewhat hollow-voiced clergyman, a little weary of his experience of the world, endlessly patient and sympathetic, and desiring to put all his tenderness and wisdom at your service while you are there. (W. James, 1909, p. 3)

James also commented about how lifelike the conversations with Rector and Hodgson could be, a feeling not possible to obtain by reading the transcripts. He discussed how difficult it was for him to decide if the drama presented by Piper was from a spirit source, or the result of psychological personation, perhaps with flashes of telepathy. This fascinating discussion presents a good example of how dissociative processes and spirit agency permeated the theoretical thoughts of some psychical researchers.

At the end of the Hodgson report, James wrote that he felt there was a will to communicate that went beyond telepathy. “But if asked whether the will to communicate be Hodgson’s, or be some mere spirit-counterfeit of Hodgson, I remain uncertain and await more facts, facts which may not point clearly to a conclusion for fifty or a hundred years” (W. James, 1909, p. 121).

Pierre Janet

When it comes to dissociation, the above-mentioned psychopathologist Pierre Janet (Figure 9), who was also interested in psychic phenomena, was one of the central figures of the nineteenth century (Evrard et al., 2018; Nicolas, 2002, Chapter 7; Van der Hart & Horst, 1989). In a reference to automatic writing, Janet (1887) stated that this



Figure 9. Pierre Janet

phenomenon represented the separation of some psychological aspects of the mind that are “grouped in a new synthesis that has the appearance of a personality” (p. 452). This practice common in mediums, he believed, was a “way . . . to penetrate further into the thoughts of somnambules” (Janet, 1886, p. 452).

In *L'Automatisme Psychologique*, published in 1889, Janet discussed various phenomena such as automatisms, hypnotic memory, and mediumship (on Janet and mediumship, see Le Mal fan, 1999, pp. 66ñ 84).¹⁵ He argued that when someone was psychologically healthy their synthesis of mental functions such as memory was cohesive, but that the opposite was the case when unhealthy conditions predominated. This produced a state of “disaggregation” (or dissociation) that could be part of hysteria and other conditions, presenting changes of personality, and the above-mentioned memory and sensoryñmotor disturbances. The person would be more sensitive to suggestion, and to other manifestations, among them catalepsy and automatic writing. “This is the state in which spiritists are so happy to see their mediums in order to evoke the spirits through the disaggregated phenomena” (Janet, 1889, p. 338). Because he believed that automatic activity and dissociation in general were inferior mental manifestations (see also Beard, 1879, and Hammond, 1876), mediumship was consequently pathologized (see Note 5).

Janet wrote that most mediums “are neuropaths, when they are not frankly hysterics” (Janet, 1889, p. 404). Furthermore, he said that “we see from time to time that the medium has some choreic movements . . . , or that the experience of automatic writing causes them great exhaustion which forces them to stop because of delicate health . . .” (p. 405).¹⁶

Janet believed that changes in the writing of the hypnotized and of mediums were of the same nature, and that both showed “the disintegration of personal perception” as well as “the formation of several personalities which sometimes succeed and sometimes develop simultaneously” (Janet, 1889, p. 413). He stated that “perfect” or fully dissociated mediums showed “the most complete type of division in which the two personalities are completely unaware and develop independently of each other” (p. 419).

In later writings Janet continued discussing the topic (Janet, 1892,

1904; Raymond & Janet 1908). “The medium,” he wrote in *N vroses et Id es Fixes*, “is an individual who dreams while awake, but who has completely lost the personal consciousness of his reverie” (Janet, 1904, pp. 394–395). Such a person is unaware of the things he has said or written, which are attributed to a deceased spirit, and sometimes to a famous one. He also maintained that in some mediums automatic writing was accompanied by a “temporarily anesthesia of the hand and even an anesthesia of hearing” (Raymond & Janet, 1908, p. 404).¹⁷

Jules H ricourt

“The state of the problem of the unconscious,” wrote Henri F. Ellenberger in his well-known work *The Discovery of the Unconscious* (1970), “as it was in the late 1880s, was sketched by H ricourt in a survey published in 1889, stating that the unconscious activity of the mind is a scientific truth established beyond any doubt . . .” (p. 314). This was a reference to French physician Jules H ricourt (1850–1938), who distinguished himself in military medicine, serotherapy, hygiene, tuberculosis, and other areas (on H ricourt, see Anonymous, 1914). Interestingly, but similar to some of his colleagues at the time, H ricourt was also interested in psychic phenomena (e.g., H ricourt, 1886).

The paper in question, entitled “L’Activit Inconsciente de l’Esprit,” was published in the French journal *Revue Scientifique*, a publication edited by Charles Richet that was devoted to discussions of developments in all areas of science (H ricourt, 1889). The article was a review of some of the phenomena considered to provide evidence for the workings of the unconscious mind, considering such topics as hysteria, hypnosis, and cases of spontaneous secondary personalities. In addition, H ricourt considered mediumship.

Mediumship, our author wrote, presents a state of trance in which “the conscious and the unconscious appears to have an independent existence, not successive, but simultaneous” (p. 265). In automatic writing the medium may write without showing awareness of what he or she is doing. In his view

some mediums, in the state of *trance*, completely have the appearance of somnambules or of hypnotized subjects; and,

in fact, one can observe in them all the degrees between a kind of hemisomnambulism, as Mr. Richet well named the state of mediums who were awake, and the state of complete somnambulism. (H ricourt, 1889, p. 265)

Conscious mediums feel, wrote H ricourt, that the medium's writing is produced by a deceased spirit. It is a real foreign personality to the conscious medium, but one in which the unconscious mind communicates to the conscious mind without the latter's awareness. "This second personality is most frequently a simpleton and extremely childish, but sometimes, on the contrary, it shows a true originality and a memory and a subtleness of which the conscious person seems completely deprived . . ." (H ricourt, 1889, p. 265).

H ricourt concluded:

The conditions of mediumship are still rather badly known. However, it seems that the aptitude for somnambulism and for suggestions is a very favorable condition. The preparation of the medium with its exercises can also explain the nature of the results obtained. Such preparation consists, indeed, in a kind of auto-hypnotization which takes the subject midway between the waking state and the state of complete hypnotism. The unconscious person appears without the conscious person, whose disintegration undoubtedly relates only to a few elements, which have disappeared or are greatly reduced. It is the hemisomnambulism of Mr. Richet (H ricourt, 1889, pp. 265-266).

Ambroise August Li beault

Another French physician who contributed to ideas about mediumship and dissociation was Ambroise August Li beault (1823-1904) (Figure 10), well-known for his influence on the Nancy school of hypnosis through his psychotherapeutic use of suggestion (on Li beault, see Carrer, 2002, and Gauld, 1992, pp. 319-324). In addition, he was interested in psychical



Figure 10.
Ambroise August
Li beault

research topics (Alvarado, 2009).

Li beault (1889) stated in his book *Le Sommeil Provoqu  et les tats Analogues* that people could answer their own questions without awareness when in hypnotic states. This was an explanation for table turning, generally explained by the action of spirits. Those acting as mediums around tables, he wrote, were in a mental state analogous to that of the dreamer who believes in unreal characters as long as he is not awake.

In Li beault's view mediums and the hypnotized were similar. He wrote that both of these individuals do not show any difference in their passive state: Concentration of thought to enter their dreams in action, isolation, automatism, insensibility, loss of memory upon awakening, all these signs are common to them; but the medium, entering his dream with the idea that he will remember the revelation of spirits and their appearance, keeps more often than the somnambule the memory of the acts of his passive state (Li beault, 1889, p. 250).

Paul Blocq

Physician Paul Blocq (1860–1896), once at the Salp tri re, and a researcher of various aspects of internal medicine and neurology (Walusinski, 2014), believed that automatic writing produced by mediums and non-mediums, such as hysterics, were similar. Both, he stated in his article “L'écriture M dianimique. Le Spiritisme au Point de Vue Scientifique,” involved lack of awareness of producing writing (Blocq, 1889).

Spiritists beliefs in discarnate agency, Blocq stated, could be questioned on the basis of the content of spirit communications. “Massillon lost his eloquence, Mozart his genius, and a good number of other no less illustrious people expressed themselves in a coarse, sometimes incomprehensible way, committing inadmissible anachronisms” (Blocq, 1889, p. 1436). He believed that such communications were produced unconsciously by the medium.

The process involved suggestions given by the sitters, and recollections from the medium's memories. “On the occasion of special influences, memory takes, as we know, an extraordinary acuteness: Its abnormal development means that in the medium, the facts, usually completely forgotten, come back as a precise memory that will animate their pen” (Blocq, 1889, p. 1436). Blocq believed that “some hysterical

states, and hypnotic somnambulism in particular, come close to becoming confused with the psychic disposition which characterizes the state of the medium” (p. 1437).

Alfred Binet

French psychologist Alfred Binet (1857–1911) (Figure 11), is well-known for his studies of hypnosis, intelligence, and other topics (on Binet, see Alvarado, 2010; Nicolas & Ferrand, 2002; T. H. Wolf, 1973). He discussed dissociation in some of his writings (e.g., Binet, 1889, 1890). In one article he commented that mediums “manage to express in a variety of ways, and often without being aware of it, a thought which is not theirs” (Binet, 1891, p. 852). In automatic writing, Binet continued, the medium presents thoughts outside of conscious awareness. There are “two coexisting personalities; because the thought that directs the automatic writing is not a disjointed thought, it has a character of its own, and even has a name, the name given to the spirit that has been evoked” (Binet, 1891, p. 854).



Figure 11. Alfred Binet

In a book about alterations of personality, Binet (1896/1892) wrote about mediumship. The book had three sections about various phenomena of dissociation such as spontaneous secondary personalities, hysteria, automatic writing, and alterations of personality using suggestion. As before, Binet affirmed that in automatic writing via mediumship there were two coexistent personalities.

Furthermore, in his view:

As with experiments in suggestion, those in spiritism succeed best on a certain class of subjects, among whom hysterical patients hold an important place. Hysterical patients, and somnambulists generally, furnish the greater part of the good mediums. One may see that by glancing over the works on spiritism. Every now and then the most discreet author finds himself obliged to say that such and such an excellent medium had a nervous crisis or was soon fatigued, in consequence of delicate health. It is, moreover, generally

admitted that spiritist performances predispose to nervous complications. (Binet, 1896/1892, pp. 229–230)

Binet also stated that mediumship also presented a tendency toward personation, believed by many to be spirits of the deceased (see Note 7). “In any case this person does not consider himself as a part of the medium, and does not apply his special memories to the medium” (Binet, 1896/1892, p. 339). Personation, Binet stated, is affected by expectations from the medium, or communicated to her from sitters at a séance. Discussing this in more detail, Binet wrote that it was the secondary self who performed the suggestion, “and who, sustaining this illusion or obligingly complying with it for we do not know exactly how it occurs goes on to write messages in the style of the person conjured up, whose name he signs” (Binet, 1896/1892, p. 340).

It is this suggestion, Binet postulated, that led to a dissociated state. Eventually, this caused the emergence of a subconscious personality.

Julian Ochorowicz

Polish philosopher Julian Ochorowicz (1850–1917) (Figure 12) was a philosopher and psychologist of many interests, including hypnotism and psychical research (Hess, 2018; Weaver, 2019). Among other things, he was an inventor, published on mental suggestion and physical mediumship (e.g., Ochorowicz, 1887, 1910), and was also interested in unusual mental states, such as dissociation.



Figure 12. Julian Ochorowicz

This interest is clear in “La Question de la Fraude dans les Expériences avec Eusapia Paladino,” a paper authored by Ochorowicz (1896) about fraud in séances with the famous Italian medium Eusapia Palladino (1854–1918), well known for her séances for physical phenomena such as movement of objects, touches, lights, and materializations.¹⁸ The paper is basically a critique of the attitude taken by researchers from the Society for Psychical Research in their

investigation of Palladino (H. Sidgwick, 1895; see also Gauld 1968), but it contains much about mediumship and dissociation.

In that investigation, Ochorowicz wrote, the researchers “did not admit in their report but two alternatives: *real phenomena*, and *conscious fraud*” (Ochorowicz, 1896, p. 96). He criticized them on the basis that they did not consider unconscious fraud. This form of fraud, Ochorowicz believed, was commonly practiced by Palladino in her sances, and it was a manifestation of what he considered to be inferior mediumship, as compared to superior mediumship, consisting of true physical phenomena.¹⁹

The English researchers, he wrote further, did not make sure that she was in trance, a state which facilitated unconscious fraud. This was a problem when they accused Palladino of premeditated fraud, a fraud she would not remember consciously. Part of this consisted of bodily movements which may have been “*motor representations that rule in a given moment the medium's imagination*” (Ochorowicz, 1896, p. 100, italics in the original).

To support his belief in Palladino's dissociative actions, Ochorowicz recounted an experience he had with the medium while she was visiting Warsaw for a series of sances. Everyone had turned in to sleep, when he saw in darkness that the medium, who was in a nearby room to that where he was with his wife, entered their room and opened and closed a drawer of his wife's dressing table. Then she left silently. They went to her room and found her in bed, apparently sleeping. She woke up and denied having been in the other room, a denial that continued the next day when asked about the incident again.

Ochorowicz, who believed that Palladino was in a somnambulistic state, decided to use table tilting to question the medium's spirit control about the incident. The improvised sance, with the medium out of trance, revealed, to Palladino's surprise, that she had in fact been in Ochorowicz's room looking for matches, and that she was neither in her normal nor trance state, but sleepwalking. This is a woman, Ochorowicz wrote, “who is capable to be in an entirely different psychic state from one moment to another” (Ochorowicz, 1896, p. 102).

Ochorowicz argued that at the beginning of a sance the medium produced inferior phenomena (automatisms leading to fraud), so she needed some time before every sance to go deeper into “physiological

doubling” (dissociation) to produce real phenomena. This involved separation between the medium’s brain and her nervous centers and separation from the “dynamism” of her bodily limbs. Ochorowicz wrote:

Before arriving at this last point, which constitutes the node of higher mediumship, the medium must necessarily cheat, because she is not aware of the position of her members, which sometimes become hyperesthetized and insensitive, or of the difference that there is between a movement performed remotely and a direct movement, since this is always *her* arm, sometimes palpable and sometimes impalpable, executing the ordered movement. Gradually the doubling increases, subjective differences are accentuated, and then we *can* be expected to watch her reflexes; her hand, which naturally seeks to free itself and to follow the direction of her thoughts, does not go too far in that direction, and does not execute the movement herself. (Ochorowicz, 1896, pp. 109–110)

Without any influence to contradict these factors, Ochorowicz affirmed, “*the medium will always cheat*” (Ochorowicz, 1896, p. 107).

Ochorowicz saw the phenomena of Palladino as produced by psychic forces related to the medium and the sitters (on this concept see Note 11). He believed that John King, the medium’s spirit control, was a “special psychic state that allowed the vital dynamism of the medium . . . to act out at a distance in certain exceptional conditions” (p. 104). In his view the action of the spirit control could change according to the suggestive influences of the circle. As he wrote:

After recognizing that the medium is only a mirror that reflects and directs the ideas and nerve forces of the sitters towards an ideoplastic goal,²⁰ we will not be surprised to see that suggestion plays an important role. It is not doubtful that the sitters can suggest to the medium the desired act, and there is no doubt that manifestations take on the character of the surrounding beliefs. I have seen “John” in the company of materialists dissolve into an impersonal force that the

medium simply called: “*questa forza*,” [this force] while in intimate circles of spiritists, he took the form of dead people, more or less clumsily. Similarly, with controllers imbued with the idea of fraud . . . *the medium will remain under the influence of a suggestion of fraud.* (Ochorowicz, 1896, p. 111)

Thodore Flournoy

Swiss psychologist Théodore Flournoy (1854–1920) (Figure 13) became well-known for his studies of mediumship and various psychological phenomena (see Alvarado et al., 2014; Clapar de, 1921). In an early paper, “Genese de Quelques Prétendus Messages Spiritiques,” Flournoy (1899) explained cases of mediumship via the “medium’s subconscious imagination, working on recollections or latent concerns” (Flournoy, 1899, p. 144). Flournoy concluded the paper stating that in healthy and normal persons the psychological state may be affected by mediumship, producing simulations of communications from spirits, being instead “the results of the subliminal operation of the ordinary faculties of the subject” (Flournoy, 1899, p. 158). The powers of this subconscious imagination, he wrote in a different paper, were able to “attain a degree of complexity and extension in no way different from the compositions and reflexions of the thinker and the novelist” (Flournoy, 1897, p. 419).



Figure 13. Théodore Flournoy

In the now classic study *From India to the Planet Mars: A Study of a Case of Somnambulism*, Flournoy (1900) focused on Hélène Smith (pseudonym for Catherine Lévesque Miller [1861–1929]), a medium who showed various automatisms and who became well-known about her communications involving planet Mars, including a Martian language, and previous lives in India and in France.²¹ Various communicators manifested through Smith, among them Victor Hugo, Marie Antoinette, and Leopold, who claimed to be Giuseppe Balsamo, the famous Cagliostro.

We are told that Smith had visions since childhood, and that she later experienced spontaneous episodes of daydreaming and reverie in

which she saw images in her field of vision and heard voices. She also had impressions of solitude and of not belonging to her family. Her years of puberty showed a “wildness of . . . dreams and automatisms, which were symptoms of a tendency to mental disintegration” (Flournoy, 1900, p. 33).

Smith showed trance, which could be partial (when she was in contact with a sitter, and with waking visions) or complete. During the latter she would awake “slowly through phases of deep sleep, alternating with relapses into somnambulistic gestures and attitudes, moments of catalepsy, etc. The final awakening is always preceded by several brief awakenings, followed by relapses into sleep” (p. 61).

Flournoy further wrote about her:

In her daily life she has only passing hallucinations limited to one or two of the senses, superficial hemisomnambulisms, compatible with a certain amount of self-possession . . . ephemeral perturbations of no importance from a practical point of view . . . In the trances, on the contrary, she presents the most grave functional alterations that one can imagine, and passes through accesses of lethargy, catalepsy, somnambulism, total change of personality . . . (Flournoy, 1900, pp. 47-48).

As a medium she showed automatic writing and what Flournoy referred to as a “tendency of the subliminal imagination to reconstruct the deceased and to feign their presence” (p. 425). She also painted images that she perceived, some of which were related to Mars, and was susceptible to suggestions during the trances that could affect her waking experiences.

The spirit personalities and “romances” by the medium were considered to be produced via

the enormous suggestibility and auto-suggestibility of mediums, which render them so sensitive to all the influences of spiritistic reunions, and are so favorable to the play of those brilliant subliminal creations in which, occasionally, the doctrinal ideas of the surrounding environment are

pendant, a brille dans ma vie, et ce rayon de feu
 plein de tout ce qui pouvoit mettre un baume sur
 une ulcère, m'avoit-foit entrevoir le ciel &
 devant-coureur des
 Dieux avoit-jugi bon

Lorsque j'ai fus le crayon
 par l'ordre de Leopold, j'ai
 voulu le tenir comme moi
 j'en ai l'habitude, mais il
 fa' voulu pretendant qui
 savait écrire ainsi et j'ai dû
 forcément le prendre la da

Leopoldes III

Fig. 7. Handwriting of Leopold. Fragment and signature of one of his letters, written by Mlle. Smith, in spontaneous hemisomnambulism.

Fig. 6. Normal handwriting of Mlle. Smith.

Figure 14. Writing of H. Smith as Leopold (above) and her usual writing (below) (Flournoy, 1900, p. 111).

reflected together with the latent emotional tendencies of the medium herself. (Flournoy, 1900, p. 443)

One of the communicators, Leopold, was seen by the medium, but also wrote automatically, producing different calligraphy than the medium (Figure 14), a phenomenon recorded from the early days of Spiritualism (e.g., Edmonds & Dexter, 1853, Appendix A). Leopold's communications, considered by Flournoy to originate from "that deep and delicate sphere in which we so often encounter the roots of hypnoid phenomena" (Flournoy, 1900, p. 91), were seen as a function of the interaction between the spiritistic context of the sance and the medium's suggestibility. This communicator "spoke with a deep bass voice, and a strong, easily recognizable Italian accent" (p. 104). The medium, Flournoy said, sometimes looked different when Leopold came through. Her "eyelids drop; her expression changes; her throat swells into a sort of double chin, which gives her a likeness of some sort to the well-known figure of Cagliostro" (p. 104).²²

FINAL THOUGHTS

Overview

It is my hope that the brief summaries presented here of the writings of Tascher, Baillarger, Taine, Richet, Myers, von Hartmann, James, Janet, Ochorowicz, H ricourt, Li beault, Blocq, Binet, and Flournoy will inform modern readers about some important, and somewhat forgotten nineteenth century ideas on the subject. To a great extent discussions of nineteenth century mediumship in terms of dissociation, and the unconscious regions of the mind, were part of a common trend to reduce unusual phenomena to known concepts of medicine and psychology (Gon alves & Ortega, 2013), a strategy seen frequently with mediumship (Le Mal fan, 1999). But there were different degrees of reductionism. Some, more consistent with the scientific establishment, only included dissociation (with manifestations such as changes of personality and state-specific memory), while others combined both dissociation and the supernormal.²³

While some of the authors of these writings emphasized the potential of the unconscious mind (Myers, Flournoy), others, as seen in the writings of Baillarger, von Hartmann, Janet, Blocq, and Binet, wrote in the context of pathology, something common in the writings of many French physicians and other nineteenth century students of mediumship (see Note 5).

Certainly, sampling biases may account for the association with pathology. If physicians looked for mediums among mental patients it is not surprising that many of them showed some degree of psychopathology. In addition, one wonders if physicians such as Janet actually saw enough mediums to make proper generalizations. But the idea did not escape criticism at the time.

The pathology of mediumship, an idea that seems to be less prevalent now, was combated by many (e.g., Crowell, 1877; Delanne, 1897b).²⁴ An example is Myers' critique of Pierre Janet, consisting of the point that Janet's observations were limited to hysterics and other medical patients, which biased his ideas (Myers, 1889, p. 188; see also Maxwell, 1905/1903, p. 261). Furthermore, Gabriel Delanne (1857–1926), an engineer and leading French spiritist, was also critical of Janet and ideas of pathology. In his *Le Ph nom ne Spirite* Delanne (1897b) stated

he had never seen hysterical crises in mediums (p. 137), and that pathology did not explain veridical phenomena with mediums (p. 143).²⁵ The latter point was also made by Italian student of psychic phenomena Ernesto Bozzano (1862–1943), known for his strong defenses of discarnate agency. Bozzano (1899) also stated that “no theory of mental disaggregation or of subconscious automatism” could explain the evidence for supernormal knowledge found in the above-cited work of Richard Hodgson with Mrs. Piper (p. 364). In his view, ideas of subconscious activity and telepathy were too “elastic” and insufficient to explain mediumship without the inclusion of discarnate agency (see also the critiques published by other defenders of the spirit agency explanation such as Brofferio, 1892, pp. 323–324, and Noel, 1885).²⁶

Myers was an example of a student of mediumship who not only discussed dissociative aspects of mediums’ performances, but also believed there was evidence to accept that mediums produced veridical phenomena, such as information about sitters that could not be accounted for by conventional mechanisms. But he went beyond this. In his view the subliminal self-manifesting via dissociative means and other ways was the real self, and one that was not material, so it was the part that would survive bodily death (Myers, 1903, Vol. 1, p. 222; for similar views see du Prel, 1889/1884, and Geley, 1899). His ideas were controversial, not only for their emphasis on veridical cases, but because at the time many speculations about the unconscious emphasized pathological processes. Perhaps Myers would have furthered his position if instead of depending mainly on the work of others, he had conducted his own observations and experiments as did Gurney (1884) and Janet (1889).

There were others who accepted veridical mediumship (e.g., Hodgson, 1892; Lodge, 1890), as did James. His work represents an important early empirical attempt to study mediumship, and to relate it to dissociation and “supernormal” aspects of the medium’s performance (Alvarado, 2016). But the majority of students of dissociation seemed to be skeptical about this possibility and ignored this aspect of the work of psychical researchers. In fact this prejudice, a problem with which psychical researchers still have to contend with today, led to the rejection of work that had the potential of enlarging conceptions of dissociation. Most of the time the veridical aspects of mediumship

were just ignored or glossed over, or explained via suppositions that were not empirical, that expressed skepticism without showing actual mistakes. Such glossing over the issue was the case with both Binet and Janet, discussed above. Von Hartmann and Flournoy were exceptions, as was Richet. But both Richet and Flournoy wrote about veridical mediumship later, which brings us to twentieth century writings.

Into the Twentieth Century

The perspective of the joint action of dissociation and veridical information was further discussed by several later students of the subject (e.g., Flournoy, 1911; Kotik, 1908; Richet, 1922; Sudre, 1926). Flournoy (1911) stated the need to consider the combination of “mental transmission [telepathy] with the products to which memory and subconscious imagination of the sitters can give birth” (p. 213). All the evidential cases with Mrs. Piper, wrote German philosopher Traugott Konstantin Oesterreich (1880–1949), might be accounted for by the medium’s creative imagination and telepathy working together (Oesterreich, 1923, pp. 44–45).

An important member of the Society for Psychical Research, Eleanor Sidgwick (1845–1936), who later became convinced of the possibility of communication with the dead, stated in her study “A Contribution to the Study of the Psychology of Mrs. Piper’s Trance Phenomena”:

I think it is probably a state of self-induced hypnosis in which her hypnotic self personates different characters either consciously and deliberately, or unconsciously and believing herself to be the person she represents, and sometimes probably in a state of consciousness intermediate between the two. In the trance state her normal powers transcend in some directions those of her ordinary waking self . . . And further . . . she can obtain, imperfectly and for the most part fragmentarily, telepathic impressions. (E. Sidgwick, 1915, p. 330)

While such ideas are plausible if one accepts both dissociation (with its dynamics and need-serving capabilities), they are also speculative to a great degree. The analyses to support them are not always clear,

and on many occasions they seem to depend on the preferences of the analyst, as compared with some clear evidence in the case, a problem shared with many psychodynamic analyses.

Nonetheless, these, and other issues, continued to be discussed during the twentieth century. Both Geley (1920/1919) and Myers (1903) disagreed with those who played down the importance of the unconscious mind and dissociation, arguing that mediumship and other phenomena showed the transcendental nature of the unconscious self, one that was not material and survived death. In Geley's words, when the higher faculties of the unconscious are released by the "decentralization" of limiting factors, we need to realize that they "are more completely accessible to us after the final rupture of those limitations by death" (Geley, 1919/1920, p. 262).²⁷

Other relevant twentieth century discussions included the writings about specific mediums such as Mrs. Smead (Hyslop, 1906a), Helene Preiswerk (1881-1911) (Jung, 1975/1902), Hiline Smith (Flournoy, 1901), Eusapia Palladino (Morselli, 1908), and Leonora E. Piper (Tanner, 1910). The personalities manifested by Preiswerk, wrote psychologist Carl G. Jung (1875-1961), "are nothing but dramatized split-offs from her dream-ego" (Jung, 1975/1902, p. 78). Similarly, Ochorowicz referred to one of Stanislaw Tomczyk's controls as an "unconscious creation" that communicated via the "complementary unconscious imagination of the medium" (Ochorowicz, 1910, p. 130).

The concept of dissociation was present in discussions of pathology (e.g., Ballet, 1911; Janet, 1909; Lévy-Valensi, 1910), including French physician Joseph Grasset's (1849-1918) complex model of automatisms involving multiple unconscious processing centers (Grasset, 1908).²⁸ Automatic writing, wrote a physician from a psychiatric hospital, was a form of psychological doubling in mediums developed due to emotional shocks, similar to those observed in the insane (Viollet, 1908, p. 25).

There were also later discussions of personation that assumed the workings of the unconscious imagination of mediums (Flournoy, 1911; Lebedzinski, 1924; Maxwell, 1905/1903). This included French writer and psychical researcher's René Sudre's (1880-1968) essays about different aspects of the phenomenon, *Personnages d'Au-Dela* (Sudre, 1946), where he discussed pathological personation, such as that seen in hysteria, in mediumship, and in other contexts. In his view, the workings of the

subliminal imagination produced personalities in both pathology and mediumship. But in mediumship, “thanks to the metapsychic faculties of the medium, they are satisfactory copies of an original that lived in the real scene of the world” (p. 59).²⁹

Writing in his well-known *Trait de M tapsychique*, Richet (1922, pp. 55–62) devoted space in the book to argue for the existence of the unconscious capabilities of mediums to create characters and stories surrounding them (see also Alvarado, 2019a, Chapter 6). In his view: “The talents of the unconscious have more variety than the talents of the conscious” (Richet, 1922, p. 50). Echoing others such as Flournoy (1900, 1911), Richet argued that such talents were a combination of the workings of the unconscious mind of the medium and its memories, which were never forgotten, a phenomenon he called “pantomnesia” (Richet, 1922, p. 59).

There were also some discussions of the different gradations of mediumistic trance and of apparent different states of consciousness (Morselli, 1908, Vol. 1, pp. 258, 272–273; E. Sidgwick, 1915, Chapters 6–7). It was argued by some that medium Eusapia Palladino showed phenomena of higher magnitude in deeper stages of trance (Lombroso, 1909, pp. 104–105; Visani Scozzi, 1901, pp. 392–393). However, Morselli (Vol. 1, p. 209) disagreed, arguing that the medium showed no “absolute correspondence with the depth or phase of her trance states.”

The idea that unconscious memories could account for some of the productions of mental mediums was accepted by some (e.g., Hyslop, 1906a, p. 215). This was also the case of American neurologist Morton Prince (1854–1929), who postulated that when the mind is in states lacking balance it may exteriorize unconscious memories. “Such phenomena,” including mediumship and automatism, “may then be interpreted as the *flowering of functioning of the unconscious*” (Prince, 1914, p. 260).³⁰

But mention must also be made of those who argued for discarnate influence as compared with secondary personalities (e.g., Bozzano, 1923; Thomas, 1922). This included, among many, Myers’ statement regarding Mrs. Thompson about his belief that most of her communications “are uttered through Mrs. Thompson’s organism by spirits who for the time inform or ‘possess’ that organism” (Myers, 1902, p. 73).

To conclude, perhaps the last word should be left to American philosopher and psychical researcher James H. Hyslop (1854–1920), who, while a strong believer in the supernormal and in survival of death, also saw that some cases could be explained by dissociation and other workings of the unconscious mind. He wrote:

The skeptic has apparently still to learn that the phenomena of secondary personality, while they indicate decided limitations to the supernormal, do not exclude the use of subliminal conditions for the transmission of it; and the ready believer in spirits has still to learn that these agencies are not so frequently active as he imagines. (Hyslop, 1906b, p. 297)

CONCLUDING REMARKS

We need to keep in mind that, in addition to dissociation, and the general workings of the unconscious mind, there are probably several other factors influencing mediumship, among them the health of mediums, the effects of practice, and the psychosocial environment in which sances are conducted. Writing about physical mediums, German physician and psychical researcher Albert F. von Schrenck-Notzing (1862–1929) mentioned the suggestive influences of sitters and experimenters, and, on the side of the mediums, their spiritualistic ideas and training, and unknown physical dispositions (Schrenck-Notzing, 1920, pp. 182–183). Certainly these, and other ideas, need to be considered in the context of the discussion presented above.

In the meantime, we would do well to remember that the ideas presented in this article belong to the various attempts – be they from psychical research, psychiatry, psychology, or Spiritualism – to explore the human mind empirically. For psychological science, ideas about mediumship were one more strand supporting the development of concepts about secondary mental states, what William James (1890a) referred to as the “hidden self.”

NOTES

- ¹ For some discussions about the historical interrelationships between mediumship and dissociation see my previous papers (e.g., Alvarado, 2010, 2014) and the work of Crabtree (1993) and Le Mal fan (1999).
- ² On this, and other relevant phenomena, see Friedman (2014) and Taves (1999). Many of these cases were referred to as trance, a term that has had different meanings and that remains to this day a vague and unprecise expression. In addition to its use to refer to alterations of consciousness in the literatures of mesmerism, hypnosis, and Spiritualism, during the last century the term was applied to automatic actions of habitual alcohol drinkers, lethargy, catalepsy, and death-like states with near-death experiences elements. Interestingly, and reflecting various theoretical emphases, the terms dream, sleep, and somnambulism were used during the nineteenth century to cover a variety of visionary and dissociative phenomena (T. James, 1995, pp. 7ñ8).
- ³ Magnetic somnambulists were also credited with producing discourses about such things as God, evil, and religion (e.g., Olivier, 1854), and about other planets and celestial bodies (e.g., Peabody, 1838, Chapters 9 and 11). Deleuze (1813, Vol. 1, pp. 181ñ182) refers to somnambulistic dissertations about metaphysical and medical topics, and about a case he saw of a six-year-old girl who talked about and answered questions about several diseases.
- ⁴ Azam (1892), Binet (1892/1896), Elliotson (1846), and Myers (1888) presented discussions of cases of secondary personalities during the nineteenth century, as did Guinon (1891ñ1892) in his discussion of published cases and cases studied at the Salp tri re. See also the work of Crabtree (1993), Hacking (1995), Kenny (1986), and Taylor and Martin's (1944) review of cases.
- ⁵ One theorist stated: "It is undeniable that the tendency of mediumship is to unhinge the mind, to destroy the mental balance, and often to produce the worst forms of insanity" (Hudson, 1893, p. 329). For overviews of pathological ideas about mediumship, see Alvarado (2018a), Alvarado and Zingrone (2012), and Le Mal fan (1999).
- ⁶ For overviews of the Piper case, see Gauld (1982, Chapter 3) and Tymn (2013). She became one of those paradigmatic cases that, in addition

to her role as a producer of evidence for survival of death, and for the workings of dissociation, provided a focus that assisted in the development of methodological and conceptual issues in psychical research, and views about the workings of mental mediumship. Regarding dissociation, her case presented much information about the complexity of various shades and stages of trance (e.g., Hodgson, 1898, pp. 397–399; see also the detailed overview by E. Sidgwick, 1915).

- ⁷ On personation see Maxwell (1903/1905, pp. 64–71), Myers (1903, Vol. 2, Chapter 9), and Sudre (1926, 1946).
- ⁸ Unconscious cerebration referred to non-conscious production of ideas and actions via automatic brain processes (Carpenter, 1874, Chapter 13). On early nineteenth-century discussions of table turning, and its explanation by the idea of unconscious muscular movements, see Alvarado (2018b).
- ⁹ On Myers' ideas see Kelly (2007). Myers was influential in terms of ideas about unconscious action, but his defense of the supernormal was not well-received by many outside psychical research circles. Writing about automatists, he stated that some authors who cited him ignored his evidence for veridical information (Myers, 1892, p. 420).
- ¹⁰ Several writers in the early spiritualist literature argued for the influence of the medium's mental content on mediumistic communications (e.g., Ballou, 1852, p. 67; Brittan, 1852; Davis, 1853, p. 203; Edmonds & Dexter, 1855, pp. 39–41). There are also discussions about problems from the side of the presumed spirit communicators (see the later writings of Hyslop, e.g., 1901b, 1914).
- ¹¹ The spiritualistic and psychical research literatures have many examples of discussions of these forces, presumed to come from the human body, as the agent behind mediumistic phenomena, such as movement of objects and materializations (for reviews, see Alvarado, 2006, and Alvarado & Nahm, 2011).
- ¹² James wrote about this: "But the odd thing is that persons unexposed to spiritualist traditions will so often act in the same way when they become entranced . . . I have no theory to publish of these cases, several of which I have personally seen" (W. James, 1890a, Vol. 1, p. 394).
- ¹³ This interest in case studies is evident in W. James' lectures about

exceptional mental states (E. Taylor, 1983) and in several of his publications (W. James, 1886, 1889, 1909). The importance of research “subjects” and clinical patients in the development of psychology and psychical research has been discussed elsewhere (e.g., Alvarado, 1993; Carroy, 1991; Hustvedt, 2011).

- ¹⁴ Another investigator of Piper reported he was not successful in making Piper perform acts with post-hypnotic suggestion, nor to obtain “some manifestation of Phinuit by gesture, speech, or automatic writing, in reply to our inquiries and commands, and during the trance state some manifestation of Mrs. Piper” (Hodgson, 1892, p. 56).
- ¹⁵ Janet cited many of Myers’ observations in his discussion of mediumship (Janet, 1889, pp. 78, 121–122, 135–136, 371, 392–394, 403, 405, 415–419). He disagreed in several ways with Myers, but he credited him with presenting a theory involving “mental disintegration” in his articles about automatic writing, which Janet thought was more developed than previously published ideas (p. 403). Crabtree (2003) has compared the approaches of both men.
- ¹⁶ Janet was citing Myers about a medium presenting choreic movements. What Myers (1885, p. 32) mentioned was “a stage of inco-ordinated movements, which might almost be taken for choreic,” a comment referring to a case reported to him that involved writing in “an abruptly, jerking, and irregular way” (Myers, 1885, p. 27), not necessarily of choreic origin. Writing about Mrs. Piper, others have referred to jerking, twitching, and convulsive movements, sometimes taking place at the beginning of her trance (Hodgson, 1898, pp. 483, 587; Hyslop, 1901a, pp. 303, 304, 312; Leaf, 1890, pp. 618–619; Lodge, 1890, p. 444). According to Hodgson (1899, p. 55), these convulsions eventually stopped. A writer discussing mediumistic trance mentioned the “more or less tonic or clonic spasms” sometimes presented by mediums (Loveland, 1889, p. 49), while another stated that six cases of mediums showing convulsions he knew about were probably influenced by suggestion because they had seen other mediums doing the same (Anonymous, 1888, p. 285). Medium Eusapia Palladino said in 1902 that she was suffering from convulsions, which descriptions suggested Jacksonian epilepsy (Morselli, 1908, Vol. 1, p. 126).

- ¹⁷ James (1889, p. 549) found tactile anesthesia in two out of three automatic writers, as did others with various mediums (Magnin, 1903, p. 233; Newbold, 1898, p. 12; Morselli, 1908, Vol. 2, p. 14; Ochorowicz, 1896, p. 100). But Flournoy (1900, p. 42) did not. In the United States, physician William A. Hammond (1828–1900) claimed that mediums frequently experienced sensations of formication, numbness, prickling, and water on the skin, which he believed were an indication of nervous problems (Hammond, 1876, p. 118). Troubles of sensibility, such as loss of sensation in parts of the body, and hyperesthesia, were frequently discussed during the nineteenth century as symptoms of hysteria (e.g., Gilles de la Tourette, 1891, Vol. 1, Chapters 4–7).
- ¹⁸ For information about Palladino's life and phenomena see the classic overviews of Carrington (1909) and de Rochas (1896, pp. 1–315), and more recent writings (e.g., Alvarado, 1993, 2011; Inglis, 1992, Chapters 35, 38).
- ¹⁹ There are many instances of (presumably unconscious) fraud throughout Palladino's career (e.g., Carrington, 1909, p. 182; Flammarion, 1907, pp. 520–521). For an early mention of possible unconscious fraud with the Fox sisters see Figuier (1860, pp. 334, 344).
- ²⁰ In this context ideoplasty referred to the use of psychic forces to fulfill an idea involving physical phenomena, a topic I have briefly discussed elsewhere (Alvarado, 2019c, pp. 79–80, see also Bozzano, 1926–1927; Hess, 2018). Ochorowicz speculated about collective agency to explain physical phenomena. This was the creation of a "separate dynamic body, at the expense of the sitters, including the medium" (Ochorowicz, 1896, p. 107), an idea similar to previous speculations about collective agency to account for physical phenomena (e.g., Anonymous, 1875; de Gasparin, 1854). The exteriorization of nerve force referred to was more clearly conceptualized later as a form of physical dissociation "between the organs [of the body] and the dynamic principle animating them, which can go as far as extra-organic manifestations, that is, outside the body" (Ochorowicz, 1909, p. 757). Similar versions of this idea were presented by others (Mackenzie, 1923, p. 200; Purdon, 1889, p. 1).
- ²¹ Flournoy's (1900) account of the case became a classic of turn-of-the-century ideas about the creative capabilities of the subconscious mind, attracting much attention in various circles (on the reception

of the book, see Alvarado & Zingrone, 2015). The book has been frequently discussed as an influential example of subliminal creative ability (e.g., Maraldi & Alvarado, 2018). In addition, Flournoy's study "became a key addition to the other paradigm cases of mediumship and multiple personality that defined the era" (E. Taylor, 2009, p. 41).

²² In a long paper Flournoy (1901) later continued discussing the case along the same lines. In addition, he discussed new communications about the Moon and Uranus, the dynamics of the Leopold communicator, and the influence of investigators on the unconscious productions of the medium. In later years the medium produced many paintings focusing on religious topics (Deonna, 1932; Lemaitre, 1908).

²³ It has been argued that inhibition (or dissociation?) of interfering material such as the content of the medium's mind and irrelevant spirit communications, could facilitate spirit action. Hodgson (1898, p. 401) referred to the need to avoid or to lessen confusions coming from various spirit communicators and from the medium's mind (see also Hyslop, 1910, p. 379; Hyslop, 1918, pp. 226, 231). This last author also argued, rather unclearly, that dissociation may be essential to real spirit mediumship, even in non-veridical cases (Hyslop, 1919, p. 403).

²⁴ There were also more complex views involving the coexistence of both pathology and supernormal phenomena (e.g., Lombroso, 1909; Lum, 1873; Morselli, 1908). See also Alvarado (2019b) and Alvarado and Biondi (2017).

²⁵ Interestingly, Delanne (1897a), like other spiritists, defended the existence of the perispirit, a fluidic body surrounding the spirit that was believed to provide a bridge between the spirit and the physical body involved with sensations, memories, and other processes. It was said that this principle explained unconscious memories and dissociation due to changes in the vibratory rate of the perispirit (p. 226). Delanne's views were consistent with some ideas of mesmeric pathology (Alvarado, 2019b).

²⁶ For reviews of such critiques in the context of Flournoy and the Society for Psychical Research, see Alvarado and Zingrone (2015) and Cerullo (1982). Independently of this, the validity and usefulness of the concept of the unconscious mind was put in doubt for other reasons during

the early twentieth century by some psychologists (e.g., Angell, 1909, p. 456; Titchener, 1915, pp. 327–328). Lack of interest in mediumship and dissociation by psychologists and psychiatrists was probably related to the lack of regard many had about the psychical researchers' emphasis in veridical mediumistic communications and the fact that there were many different concepts about the unconscious, most of which were not open to veridical manifestations (Münsterberg et al., 1910).

²⁷ Geley (1905) had already written about this in an earlier book in which he defended the existence of a subconscious mind with supernormal faculties. This self, he maintained, operated independently of the physical body, and preexisted and survived the physical body.

²⁸ He proposed the existence of a superior psychism (our usual state of consciousness) and of an inferior psychism, made of a series of “polygons,” or supposed centers in the nervous systems in charge of specific sensory and motor functions, generally automatic and unconscious. The polygons could coordinate the phenomena of mediumship (and other processes such as imagination, memory, and motor activity), during trance and during pathological states. Grasset also postulated that polygonal action did not involve veridical manifestations. In his view a medium was an individual with a facility to manifest polygonal action more than most persons. See also Grasset (1904, 1906).

²⁹ Another discussion of personation, and other mediumistic productions, came from the Italian psychiatrist Enrico Morselli (1852–1929), who discussed the topic in his book *Psicologia e Spiritismo* (Morselli, 1908, Vol. 2, pp. 63–67, 115–119). He argued that ideas in the unconscious minds of mediums, characterized by an infantile mentality, emerged when the medium was in the proper state. These ideas were organized by “the subconscious Imagination [which] . . . arranges them in its own way, fertilizes and complicates them, and builds spirit romances” (Vol. 2, p. 468). Morselli was also keen to point out that phenomena took place when Palladino presumably was in her waking state, and that the medium “follows with her conscious attention all the developments of the phenomena . . .” (Morselli, 1908, Vol. 1, p. 385).

³⁰ Many other topics were considered during the early twentieth

century, among them the concept of unconscious fraud (Hamilton et al., 1911), the similarity of spirit communicators to the phenomena reported in double and multiple personality cases (Troubridge, 1922), and analyses of automatic writing in terms of the authorship of the messages (anonymous and signed messages), the content of the messages (length, meaningless phrases), and language issues (meaningless words, poetic expressions) (Verrall, 1906).

ACKNOWLEDGMENTS

I am grateful to the Research Grants Committee of the Society for Psychical Research for funding the research that supported this paper.

REFERENCES

- A., J. A. (1869). Remarkable case of somnambulism. *Chicago Medical Journal*, 26(20), 650-655.
- Abercrombie, J. (1838). *Inquiries concerning the intellectual powers and the investigation of truth* (8th ed.). J. Murray.
- Aksakof, A. (1895). *Animisme et spiritisme* [Animism and Spiritism] (B. Sandow, Trans.). P.-G. Leymarie [Original work published in German 1890]
- Alvarado, C. S. (1993). Gifted subjects' contributions to psychical research: The case of Eusapia Palladino. *Journal of the Society for Psychical Research*, 59(833), 269-292.
- Alvarado, C. S. (2002). Dissociation in Britain during the late nineteenth century: The Society for Psychical Research, 1882-1900. *Journal of Trauma and Dissociation*, 3(2), 9-33. https://doi.org/10.1300/j229v03n02_02
- Alvarado, C. S. (2006, July). Human radiations: Concepts of force in mesmerism, spiritualism and psychical research. *Journal of the Society for Psychical Research*, 70.3(884), 138-162.
- Alvarado, C. S. (2009). Ambroise August Li beault and psychic phenomena. *American Journal of Clinical Hypnosis*, 52(2), 111-121. <https://doi.org/10.1080/00029157.2009.10401702>
- Alvarado, C. S. (2010, December). Classic text No. 84: 'Divisions of personality and spiritism' by Alfred Binet (1896). *History of Psychiatry*, 21(4), 487-500. <https://doi.org/10.1177/0957154x10380513>
- Alvarado, C. S. (2011, March). Eusapia Palladino: An autobiographical essay. *Journal of Scientific Exploration*, 25(1), 77-101. https://www.scientificexploration.org/docs/25/jse_25_1_Alvarado.pdf
- Alvarado, C. S. (2014, January). Mediumship, psychical research, dissociation, and the powers of the subconscious mind. *Journal of Parapsychology*, 78(1), 98-114.

- Alvarado, C. S. (2016, March). Classic Text No. 105: 'Report of the Committee on Mediumistic Phenomena,' by William James (1886). *History of Psychiatry*, 27(1), 85–100. <https://doi.org/10.1177/0957154X15623221>
- Alvarado, C. S. (2018a). Mediumship and pathology. In R. McLuhan (Ed.), *Psi encyclopedia*. <https://psi-encyclopedia.spr.ac.uk/articles/mediumship-and-pathology>
- Alvarado, C. S. (2018b, December). Table turning in the early 1850s: The strange reports of Agnor de Gasparin. *Journal of Scientific Exploration*, 32(4), 723–762.
- Alvarado, C. S. (2019a). *Charles Richet: A Nobel Prize winning scientist's explorations of psychic phenomena*. White Crow Books.
- Alvarado, C. S. (2019b, September). Classic text No. 119: Jules Bernard Luys on magnetic pathology. *History of Psychiatry*, 30(3), 359–374. <https://doi.org/10.1177/0957154X19830955>
- Alvarado, C. S. (2019c, March). Musings on materializations: Eric J. Dingwall on "The Plasma Theory." *Journal of Scientific Exploration*, 33(1), 73–113. https://www.scientificexploration.org/docs/33/jse_33_1_Alvarado.pdf
- Alvarado, C. S., & Biondi, M. (2017, June). Classic Text No. 110: Cesare Lombroso on mediumship and pathology. *History of Psychiatry*, 28(2), 225–241. <https://doi.org/10.1177/0957154X16686904>
- Alvarado, C. S., Maraldi, E. O., Machado, F. R., & Zangari, W. (2014, July). Theodore Flournoy's contributions to psychical research. *Journal of the Society for Psychical Research*, 78.3(916), 149–168.
- Alvarado, C. S., & Nahm, M. (2011, April). Psychic phenomena and the vital force: Hereward Carrington on "Vital energy and psychical phenomena." *Journal of the Society for Psychical Research*, 75.2(903), 91–103.
- Alvarado, C. S., & Zingrone, N. L. (2012, July). Classic Text No. 90: 'The Pathology and Treatment of Mediomania,' by Frederic Rowland Marvin (1874). *History of Psychiatry*, 23(2), 229–244. <https://doi.org/10.1177/0957154X10396769>
- Alvarado, C. S., & Zingrone, N. L. (2015, July). Note on the reception of Theodore Flournoy's study of Des Indes à la Planète Mars. *Journal of the Society for Psychical Research*, 79.3(920), 156–164.
- Angell, J. R. (1909). *Psychology: An introductory study of the structure and function of human consciousness* (4th rev. ed.). Henry Holt.
- Anonymous. (1854, April 22). Spirit personations and death scenes. In *The Spiritual Telegraph* (Vol. III: *Telegraph Papers*), 201–206. Partridge & Brittan.
- Anonymous. (1875, March 19). Speculations relating to new facts in spiritualism. *Spiritualist Newspaper*. http://iapsop.com/archive/materials/spiritualist/spiritualist_v6_n12_mar_19_1875.pdf
- Anonymous. (1888, November 16). The connection of hypnotism with the subjective phenomena of spiritualism. *Proceedings of the Society for Psychical Research*, 5(13), 279–287. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v5_16_november_1888.pdf

- Anonymous. (1914). Le Docteur Jules H ricourt Notice biographique [Doctor Jules H ricourt A biographical note]. *Science et Vie*, 4(11), 277.
- Azam, [E. E.]. (1887). *Hypnotisme, double conscience et alt rations de la personnalit : Le cas Felida X* [Hypnotism, double consciousness and alterations of personality]. J.-B. Bailli re et fils.
- Azam, E. (1892). Double consciousness. In D. H. Tuke (Ed.), *A dictionary of psychological medicine* (Vol. 1, pp. 401ñ406). J. & A. Churchill.
- Baillarger, J. (1861). [Untitled communication to the Soci t M dico-Psychologique]. *Annales M dico-Psychologiques*, 7(3), 92ñ93.
- Ballet, G. (1911). La psychose hallucinatoire chronique et la d sagr gation de la personnalit [Chronic hallucinatory psychosis and the disaggregation of personality]. *Lenc phale*, 8(6), 501ñ508.
- Ballou, A. (1852). *An exposition of views respecting the principal facts, causes, and peculiarities involved in spirit manifestations*. Bela Marsh.
- Barkworth, T. (1891ñ1892). Some recent experiments in automatic writing. *Proceedings of the Society for Psychical Research*, 7(18), 23ñ29.
- Baxter, R. (1833). *Narrative of facts, characterizing the supernatural manifestations in members of Mr. Irwin's congregation and other individuals, in England and Scotland, and formerly in the writer himself*. James Nisbet.
- Beard, G. M. (1879, July). The psychology of spiritualism. *North American Review*, 129, 65ñ81.
- Beaunis, H. (1885, July). L'expérimentation en psychologie par le somnambulisme provoqu [Experimentation in psychology by induced somnambulism]. *Revue Philosophique de la France et de l tranger*, 20, 1ñ36, 113ñ134. <https://www.jstor.com/stable/41074536>
- Belden, L. W. (1834). *An account of Jane C. Rider, the Springfield somnambulist: The substance of which was delivered as a lecture before the Springfield Lyceum*, Jan. 22, 1834. G. and C. Merriam.
- Bertrand, A. (1823). *Trait du somnambulisme et des differentes modifications qu'il pr sente* [Treatise on somnambulism and the different modifications it presents]. J. G. Dentu.
- Binet, A. (1889, February). Recherches sur les alt rations de la conscience chez les hyst riques [Investigations about the alterations of consciousness of movements in hysterics]. *Revue Philosophique de la France et de l tranger*, 27, 135ñ170. <https://www.jstor.com/stable/41075010>
- Binet, A. (1890). *On double consciousness: Experimental psychological studies*. Open Court.
- Binet, A. (1891, February 15). Les alt rations de la personnalit d'apr s les travaux r cents [Alterations of personality according to recent works]. *Revue des deux Mondes*, 103, 839ñ855. <https://www.jstor.com/stable/44760932>
- Binet, A. (1896). *Alterations of personality*. D. Appleton. [Original published in French 1892]

- Binet, A., & F r , C. (1887). Recherches exp rimentales sur la physiologie des mouvements chez les hyst riques [Experimental researches into the physiology of hysterics]. *Archives de Physiologie Normale et Pathologique*, 9(s. 3), 320ñ373.
- Biondi, M. (1988). *Tavoli e medium: Storia dello Spiritismo in Italia* [Tables and mediums: History of Spiritism in Italy]. Gremese.
- Blocq, P. (1889). L' criture m dianimique [Mediumistic writing]. *Bulletin M dical*, 3, 1435ñ1437.
- Bourneville, [D. M.] (Ed.). (1886). *Oeuvres compl tes de J. M. Charcot* [Complete works of J. M. Charcot] (Vol. 1). Bureaux du Progr s M dical.
- Bourru, H., & Burot, P. (1888). *Variations de la personnalit* [Variations of personality]. J.-B. Bailli re.
- Bozzano, E. (1899). Spiritualismo e critica scientifica [Spiritualism and scientific criticism]. *Rivista di Studi Psicfici*, 5(11ñ12), 356ñ379.
- Bozzano, E. (1923, May 31ñJune 30). La storia di "Stasia" [The history of "Stasia"]. *Luce e Ombra*, 23(5ñ6), 171ñ179. http://iapsop.com/archive/materials/luce_e_ombra/luce_e_ombra_v23_1923.pdf
- Bozzano, E. (November 1926ñJuly 1927). Pensiero e volont: Forze plasticizzante e organizzanti [Thought and will: Plasticizing and organizing forces]. *Luce e Ombra*, 26(11), 481ñ488; 26(12), 556ñ563; 27(1), 34ñ44; 27(2ñ3), 60ñ69, 27(4), 164ñ175; 27(5), 223ñ230; 27(6)250ñ262.
- Braid, J. (1853). *Hypnotic therapeutics, illustrated by cases: With an appendix on table-moving and spirit-rapping*. Murray and James
- Brittan, S. B. (1852). Cerebral influence on revelation. *The Shekinah*, 2, 39ñ43. http://iapsop.com/archive/materials/shekinah/shekinah_v2.pdf
- Brittan, S. B., & Richmond, B. W. (1853). *A discussion of the facts and philosophy of ancient and modern spiritualism*. Partridge & Brittan.
- Brofferio, A. (1892). *Per lo Spiritismo* [About Spiritism]. Domenico Briola.
- Cahagnet, L.A. (1848ñ1854). *Magnetisme* [Magnetism] (3 vols.). Author (Vol. 1) and Germer Bailli re (Vols. 2 and 3).
- [Carpenter, W. B.]. (1853). Electrobiology and mesmerism. *Quarterly Review*, 93(186), 501ñ557.
- Carpenter, W. B. (1874). *Principles of mental physiology*. D. Appleton.
- Carrer, L. (Comp. & Transl.) (2002). *Ambroise-August Li beault: The hypnological legacy of a secular saint*. Virtualbookworm.com
- Carrington, H. (1909). *Eusapia Palladino and her phenomena*. B. W. Dodge.
- Carroy, J. (1991). *Hypnose, suggestion et psychologie: L'invention de sujets* [Hypnosis, suggestion and psychology: The invention of subjects]. Presses Universitaires de France. <https://doi.org/10.3917/puf.carro.1991.01>
- Carroy, J., & Plas, R. (1996, February). The origins of French experimental psychology: Experiment and experimentalism. *History of the Human Sciences*, 9(1), 73ñ84.
- Carus, C. G. (1857). *ber Lebensmagnetismus und ber die magischen Wirkungen b erhaup*t [About the magnetism of life and magical effects]. F. A. Brockhaus.

- Casaubon, M. (1655). *A treatise concerning enthusiasme*. Printed by R. D.
- Cerullo, J. J. (1982). *The secularization of the soul: Psychical research in modern Britain*. Institute for the Study of Human Issues.
- Chambard, E. (1879, April). Sur un cas d'hystérie avec somnambulisme [On a case of hysteria with somnambulism]. *Revue Mensuelle de Médecine et de Chirurgie*, 3, 273-288.
- Charpignon, J. (1848). *Physiologie, médecine et métaphysique du magnétisme* [Physiology, medicine and metaphysics of magnetism]. Germer Baillière.
- Claparède, E. (1921). Théodore Flournoy: Sa vie et son œuvre [Theodore Flournoy: His life and work]. *Archives de Psychologie*, 18(69-70), 1-125.
- Cox, R. S. (2003). *Body and soul: A sympathetic history of American Spiritualism*. University of Virginia Press.
- Crabtree, A. (1993). *From Mesmer to Freud: Magnetic sleep and the roots of psychological healing*. Yale University Press.
- Crabtree, A. (2003). "Automatism" and the emergence of dynamic psychiatry. *Journal of History of the Behavioral Sciences*, 39(1), 51-70. <https://doi.org/10.1002/jhbs.10089>
- Cridge, A. (1854). *Epitome of spirit-intercourse*. Bela Marsh.
- Crowell, E. (1877). *Spiritualism and insanity*. Colby & Rich.
- D., M. (1867, March). Guardians of strength. *Spiritual Magazine*, 2(n.s.), 112-118. http://iapsop.com/archive/materials/spiritual_magazine_uk/spiritual_magazine_s2_v2_n3_mar_1867.pdf
- Dailey, A. H. (1894). *Mollie Fancher, the Brooklyn enigma*. Eagle Book Printing.
- Davis, A. J. (1847). *The principles of nature, her divine revelations, and a voice to mankind* (3rd ed.). S. S. Lyon and Wm. Fishbough.
- Davis, A. J. (1853). *The present age and inner life: A sequel to spiritual intercourse: Modern mysteries classified and explained*. Partridge and Brittan.
- de Gasparin, Cte A. (1854). *Des tables tournantes* [Turning tables] (2 vol.). E. Dentu.
- Delanne, G. (1897a). *Levolution animique: Essais de psychologie suivant le spiritisme* [Soul evolution: Psychology according to Spiritism]. Chamuel.
- Delanne, G. (1897b). *Le phénomène spirite: Témoignages des savants* [Spiritist phenomena: The testimony of scholars] (5th ed.). Chamuel.
- Deleuze, J. P. F. (1813). *Histoire critique du magnétisme animal* [Critical history of animal magnetism] (Vol. 1). Mame.
- Deleuze, J. P. F. (1825). *Instruction pratique sur le magnétisme animal* [Practical instruction about animal magnetism]. J.-G. Dentu.
- De Morgan, S. E. [originally published with the pseudonym CD] (1863). *From matter to spirit*. Longman, Green, Longman, Roberts, & Green.
- Deonna, W. (1932). *De la planète Mars en Terre Sainte: Art et subconscient* [On planet Mars in Holy Land]. E. de Boccard.
- de Rochas, A. (1896). *L'extériorisation de la motricité* [The exteriorization of motricity]. Chamuel.

- Despine, A. (1840). *De l'emploi du magnétisme animal et des eaux minérales dans le traitement des maladies nerveuses* [On the use of animal magnetism and mineral waters in the treatment of nervous diseases]. Germer Baillière.
- Dessoir, M. (1890). *Das Doppel-Ich* [The double self]. Ernest Gauthier.
- Dewar, H. (1823). Report on a communication from Dr. Dyce of Aberdeen, to the Royal Society of Edinburgh, "On uterine irritation and its effects on the female constitution." *Transactions of the Royal Society of Edinburgh*, 9(2), 365-379. [Republished by Cambridge University Press 2013: <https://doi.org/10.1017/s0080456800030969>]
- Du Prel, C. (1889). *The philosophy of mysticism* (2 vols.). George Redway. [Original work published in German 1884]
- Du Prel, C. (1907). *La magie: Science naturelle* [Magic: A natural science] (Vol. 1). H. Vaillant-Carmanne. [Original work published in German 1899]
- Edelman, N. (1995). *Voyantes, guérisseuses et visionnaires en France 1785-1914* [Seers, healers and visionaries in France, 1785-1914]. Albin Michel.
- Edmonds, Judge [J. W.]. (1860). Letters to the "New York Tribune," on Spiritualism [Spiritual Tracts, No. 10]. No publisher.
- Edmonds, Judge [J. W.]. (n.d., ca 1875). *Letters and tracts on Spiritualism* (J. Burns, Ed.). J. Burns. http://iapsop.com/ssoc/1875__edmonds_tappan__letters_and_tracts_on_spiritualism.pdf
- Edmonds, J. W., & Dexter, G. T. (1853). *Spiritualism*. Partridge & Brittan.
- Edmonds, J. W., & Dexter, G. T. (1855). *Spiritualism*. Partridge & Brittan.
- Ellenberger, H. F. (1970). *The discovery of the unconscious: The history and evolution of dynamic psychiatry*. Basic Books.
- Elliotson, J. (1843). *Numerous cases of surgical operation without pain in the mesmeric state*. H. Baillière.
- Elliotson, J. (1846, July). Instances of double states of consciousness independent of mesmerism. *Zoist*, 4(14), 157-187. http://iapsop.com/archive/materials/zoist/zoist_v4_n14_july_1846.pdf
- Ermacora, G. B. (1894, February). Attività subcosciente e spiritismo [Subconscious activity and spiritism]. *Lux: Bolletino dell'Accademia Internazionale per gli studi psicologici*, 6(2), 37-48. http://iapsop.com/archive/materials/lux_rome/lux_v6_1893.pdf
- Esdale, J. (1847). *Mesmerism in India, and its practical application in surgery and medicine*. Silas Andrus and Son.
- Evrard, R., Pratte, E. A., & Cardea, E. (2018). Pierre Janet and the enchanted boundary of psychical research. *History of Psychology*, 21(2), 100-125. <https://doi.org/10.1037/hop0000086>
- Faraday, M. (1853, July 2). Professor Faraday on table-moving. *The Athenaeum: Journal of Literature, Science, and the Fine Arts*, No. 1340, 801-803.
- Figuier, L. (1860). *Histoire du merveilleux dans les temps modernes* [History of the marvellous during modern times] (Vol. 4). Hachette.
- Flammarion, C. (1907). *Mysterious psychic forces*. Small, Maynard.

- Flournoy, T. (1897). Quelques faits d'imagination subliminale chez les médiums [Some facts of subliminal imagination in mediums]. In *Dritter Internationaler Congress für Psychologie in München vom 4. bis 7. August, 1896*. (pp. 419-420). J. F. Lehmann.
- Flournoy, T. (1899, February). Genesis de quelques prétendus messages spirites [Genesis of some supposed spirit messages]. *Revue Philosophique de la France et de l'étranger*, 47, 144-158.
- Flournoy, T. (1900). *From India to the Planet Mars: A study of a case of somnambulism with glossolalia*. Harper & Brothers. <https://doi.org/10.1037/10911-000>
- Flournoy, T. (1901, December). Nouvelles observations sur un cas de somnambulisme avec glossolalie [New observations of a case of somnambulism with glossolalia]. *Archives de Psychologie*, 1(2), 101-125. <https://archive.org/details/nouvellesobservooflou/page/n3/mode/2up>
- Flournoy, T. (1911). *Spiritism and psychology*. Harper & Brothers.
- Foschi, R. (2003). L'indagine sulla personalità alle origini della psicologia scientifica francese (1870-1885) [The investigation of personality at the origins of French scientific psychology (1870-1885)]. *Physis*, 40(1-2), 63-105.
- Friedman, K. A. K. (2014). *Soul sleepers: A history of somnambulism in the United States, 1740-1840*. Doctoral dissertation, Harvard University.
- Garrett, C. (1987). *Spirit possession and popular religion: From the Camisards to the Shakers*. John Hopkins University Press.
- Gauld, A. (1968). *The founders of psychical research*. Routledge and Kegan Paul.
- Gauld, A. (1982). *Mediumship and survival: A century of investigations*. Heinemann.
- Gauld, A. (1992). *A history of hypnotism*. Cambridge University Press.
- Gauthier, A. (1842). *Histoire du somnambulisme chez tous les peuples* [History of somnambulism in all people] (2 vols.). Félix Malteste.
- Gauthier, A. (1845). *Traité pratique du magnétisme et du somnambulisme* [Practical treatise of magnetism and somnambulism]. Germer Baillière.
- Geley, G. [under the pseudonym E. Gyel]. (1899). *L'être subconscient* [The subconscious being]. Félix Alcan.
- Geley, G. (1905). *L'être subconscient* [The subconscious being] (2nd ed.). Félix Alcan.
- Geley, G. (1920). *From the unconscious to the conscious*. Williams Collins Sons. [Original work published in French in 1919]
- Gilles de la Tourette, [G.]. (1891). *Traité clinique et thérapeutique de l'hystérie d'après l'enseignement de la Salpêtrière* [Clinical and therapeutic treatise of hysteria according to the teachings of the Salpêtrière] (Vol. 1). E. Plon, Nourrit.
- Gonçalves, V. P., & Ortega, F. (2013, April/June). Uma nosologia para os fenômenos sobrenaturais e a construção do conceito "possuído" no século XIX [A nosology for supernatural phenomena and the construction of the "possessed" brain during the XIXth century]. *Historia, Ciências, Saúde-Manguinhos*, 20(2), 373-390. <https://doi.org/10.1590/S0104-59702013005000004>
- Grasset, J. (1904). *Le Spiritisme devant la science* [Spiritism before science]. Coulet et Fils.

- Grasset, J. (1906). *Le psychisme inferieur* [The inferior psychism]. Chevalier et Riviere.
- Grasset, J. (1908). *L'occultisme hier et aujourd'hui* (2nd ed.). Coulet et Fils.
- Gregory, L. M. (1866, May). A seance with Mr. Home. *Spiritual Magazine*, 1(n.s.), 226-227. http://iapsop.com/archive/materials/spiritual_magazine_uk/spiritual_magazine_s2_v1_n5_may_1866.pdf
- Gregory, W. (1851). *Letters to a candid inquirer, on animal magnetism*. Blanchard & Lea.
- Gregory, W. (1856). Le spiritualisme en Angleterre [Spiritualism in England]. *Journal du Magnetisme*, 15(238), 309-334. http://iapsop.com/archive/materials/journal_du_magnetisme/journal_du_magnetisme_v15_1856.pdf
- Guinon, G. (1891-1892). Documents pour servir l'histoire des somnambulismes [Documents for the history of somnambulism]. *Progress Medical*, 13(s. 2), (20), 401-404, (21), 425-429, (23) 460-466, (26), 513-517; 14(s. 2), (29), 41-49, (34) 137-141; 15(s. 2), (11), 193-196, (13), 236-238, (19), 361-364, (21), 401-402; 16(s. 2), (27), 1-4, (28), 17-21, (31), 73-76, (34), 131-134.
- Gurney, E. (1884, January). The stages of hypnotism. *Proceedings of the Society for Psychical Research*, 2(5), 61-72. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v2_18_january_1884.pdf
- Gurney, E., & Myers, F. W. H. (1885, May-June). Some higher aspects of mesmerism. *Proceedings of the Society for Psychical Research*, 3(9), 401-423. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v3_may_june_1885.pdf
- Hacking, I. (1995). *Rewriting the soul: Multiple personality and the sciences of memory*. Princeton University Press.
- Haddock, J. W. (1851). *Somnolism & psychism* (2nd ed.). James S. Hodson.
- Hamilton, W. H., Smyth, J. S., & Hyslop, J. H. (1911). A case of hysteria. *Proceedings of the American Society for Psychical Research*, 5(10), 1-656. http://iapsop.com/archive/materials/aspr_proceedings/aspr_proceedings_v5_1911.pdf
- Hammond, W. A. (1876). *Spiritualism and allied causes and conditions of nervous derangement*. G. P. Putnam's Sons.
- Hardinge, E. (1860). *Six lectures on theology and nature*. Hitt.
- Hericourt, J. (1886, February). Un cas de somnambulisme à distance [A case of somnambulism at a distance]. *Revue Philosophique de la France et de l'étranger*, 21, 200-203.
- Hericourt, J. (1889). L'activité inconsciente de l'esprit [The unconscious activity of the mind]. *Revue Scientifique*, 44(9), 257-268.
- Hess, K. M. (2018). The idea of ideoplasty and occult phenomena in the theoretical and empirical research of Julian Ochorowicz. *Preternature*, 7(2), 239-274. <https://doi.org/10.5325/preternature.7.2.0239>
- Hill-Tout, C. H. (1895). Some psychical phenomena bearing upon the question of spirit control. *Proceedings of the Society for Psychical Research*, 11(28), 309-316. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v11_1895.pdf
- Hodgson, R. (1891). A case of double consciousness. *Proceedings of the Society for*

- Psychical Research*, 7(19), 221-255. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v7_1891-2.pdf
- Hodgson, R. (1892). A record of observations of certain phenomena of trance. *Proceedings of the Society for Psychical Research*, 8(21), 1-167. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v8_1892.pdf
- Hodgson, R. (1898). A further record of observations of certain phenomena of trance. *Proceedings of the Society for Psychical Research*, 13(33), 284-582. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v13_1897-8.pdf
- Hodgson, R. (1899, February 4). Miss Freer and Mrs. Piper. *Light*, 19(943), 55-56. http://iapsop.com/archive/materials/light/light_v19_feb_1899.pdf
- Hudson, T. J. (1893). *The law of psychic phenomena: A working hypothesis for the systematic study of hypnosis, spiritism, mental therapeutics, etc.* A. C. McClurg.
- Hustvedt, A. (2011). *Medical muses: Hysteria in Nineteenth-Century Paris*. W. W. Norton.
- Hyslop, J. H. (1901a). A further record of observations of certain trance phenomena. *Proceedings of the Society for Psychical Research*, 16(41), 1-649. <https://www.unz.com/print/Harpers-1901mar-00632/>
- Hyslop, J. H. (1901b, March). Nature of life after death. *Harper's Monthly Magazine*, 102(610), 632-639. <https://www.unz.com/print/Harpers-1901mar-00632/>
- Hyslop, J. H. (1906a). Apparent subconscious fabrication. *Journal of Abnormal Psychology*, 1(5), 201-215. <https://doi.org/10.1037/h0074871>
- Hyslop, J. H. (1906b). *Borderland of psychic research*. Herbert B. Turner.
- Hyslop, J. H. (1910). A record and discussion of mediumistic experiments. *Proceedings of the American Society for Psychical Research*, 4(1), 1-812. http://iapsop.com/archive/materials/aspr_proceedings/aspr_proceedings_v4_1910.pdf
- Hyslop, J. H. (1914). A hypothetical process of communication. *Journal of the American Society for Psychical Research*, 8(8), 377-389. http://iapsop.com/archive/materials/aspr_proceedings/aspr_journal_v8_1914.pdf
- Hyslop, J. H. (1918). *Life after death: Problems of the future life and its nature*. E. P. Dutton.
- Hyslop, J. H. (1919). *Contact with the other world: The latest evidence as to communication with the dead*. Century.
- Inglis, B. (1992). *Natural and supernatural: A history of the paranormal from earliest times to 1914* (Rev. ed.). Prism.
- James, T. (1995). *Dream, creativity, and madness in nineteenth-century France*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780198151883.001.0001>
- James, W. (1886, July). Report of the Committee on Mediumistic Phenomena. *Proceedings of the American Society for Psychical Research*, 1(2), 102-106. http://iapsop.com/archive/materials/aspr_proceedings/aspr_proceedings_v1_1885-1889.pdf
- James, W. (1889, March). Notes on automatic writing. *Proceedings of the American*

- Society for Psychical Research*, 1(4), 548-564. http://iapsop.com/archive/materials/aspr_proceedings/aspr_proceedings_v1_1885-1889.pdf
- James, W. (1890a, March). The hidden self. *Scribner's Magazine*, 7(3), 361-373. <https://babel.hathitrust.org/cgi/pt?id=umn.319510019199803&view=1up&seq=373>
- James, W. (1890b). The principles of psychology (Vol. 1). Henry Holt. <https://doi.org/10.1037/10538-000>
- James, W. (1890c). A record of observations of certain phenomena of trance (5) Part III. *Proceedings of the Society for Psychical Research*, 6(17), 651-659. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v6_11_july_1890.pdf
- James, W. (1909). Report on Mrs. Piper's Hodgson-control. *Proceedings of the Society for Psychical Research*, 23(58), 2-121.
- Janet, P. (1886, December). Les actes inconscients et la doublement de la personnalité pendant le somnambulisme provoqué [Unconscious acts and the doubling of personality during induced somnambulism]. *Revue Philosophique de la France et de l'étranger* 22, 577-592.
- Janet, P. (1887, May). L'anesthésie systématique et la dissociation des phénomènes psychiques [Systematized anesthesia and the dissociation of psychic phenomena]. *Revue Philosophique de la France et de l'étranger*, 23, 449-472.
- Janet, P. (1889). *L'automatisme psychologique* [Psychological automatism]. Félix Alcan.
- Janet, P. (1892, April). Le spiritisme contemporain [Contemporary Spiritism]. *Revue Philosophique de la France et de l'étranger*, 33, 413-442.
- Janet, P. (1904). *Neuroses et idées fixes* [Neuroses and fixed ideas] (2nd ed., Vol. 1). Félix Alcan.
- Janet, P. (1909). Délire systématique la suite de pratiques du spiritisme [Systematic delirium as a consequence of spiritist practices]. *L'encephale*, 4(4), 363-367.
- Jung, C. G. (1975). On the psychology and pathology of so-called occult phenomena. In C. G. Jung, *Psychiatric studies* (The collected works of C. G. Jung, Vol. 1, pp. 3-8). Princeton University Press [First published in German 1902]
- Kelly, E. W. (2007). F. W. H. Myers and the empirical study of the mind-body problem. In E. Kelly, E. W. Kelly, A. Crabtree, A. Gauld, M. Grosso, & B. Greyson, *Irreducible mind: Toward a psychology for the 21st century* (pp. 47-115). Rowman & Littlefield.
- Kenny, M. G. (1986). *The passion of Ansel Bourne: Multiple personality in American culture*. Smithsonian Institution Press.
- Kerner, J. A. C. (1845). *The seeress of Prevorst*. J. C. Moore. [Abridgement of Kerner's *Die Seherin von Prevorst*, 1829, C. Crowe (tr.)]
- Knapp, K. D. (2017). *William James: Psychical research and the challenge of modernity*. University of North Carolina Press. <https://doi.org/10.5149/northcarolina/9781469631240.001.0001>
- Kotik, N. G. (1908). *Die Emanation der psychophysischen Energie*. [The emanation of psychophysical energy]. J. F. Bergmann.
- Lafontaine, C. (1860). *L'art de magnétiser, ou le magnétisme animal considéré sous*

- le point de vue th orique, pratique et th rapeutique* [The art of magnetizing, or animal magnetism considered from the theoretical, practical and therapeutic point of view] (3rd ed.). Germer Bailli re.
- [Lang, W.]. (1843). *Mesmerism*. Fraser.
- Lausanne [pseudonym of Sarrazine de Montferrier, A. A. V.]. (1816, July 1). Histoire du magn tisme animal [History of animal magnetism]. *Annales du Magn tisme Animal*, 2, 3ñ26.
- Leaf, W. (1890). A record of observations of certain phenomena of trance (3). Part II. *Proceedings of the Society for Psychical Research*, 6(17), 558ñ646.
- Lebiedzinski, P. (1924). L'ideoplastie comme hypoth se directrice des tudes m tapsychiques [Ideoplasty as the directing hypothesis of metapsychic studies]. In *L'Etat Actuel des Recherches Psychiques d apr s les travaux du Ilme Congr s International tenu Varsovie en 1923 en l honneur du Dr Julien Ochorowicz* (pp. 286ñ300). Presses Universitaires de France.
- Lema tre, A. (1908, July). Un nouveau cycle somnambulique de Mlle Smith [A new somnambulatory cycle of Mlle Smith]. *Archives de Psychologie*, 7, 63ñ83.
- Le Mal fan, P. (1999). *Folie et Spiritisme (1850ñ1950)* [Madness and Spiritism]. L'Harmattan.
- L vy-Valensi, J. (1910). Spiritisme et folie [Spiritism and madness]. *L'Enc phale*, 5(6), 696ñ716.
- Li beault, A.-A. (1889). *Le sommeil provoqu et les tats analogues* [Induced sleep and similar states]. Octave Doin.
- Lodge, O. (1890). A record of observations of certain phenomena of trance (2). Part I. *Proceedings of the Society for Psychical Research*, 6(17), 443ñ557. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v6_11_july_1890.pdf
- Lombardo, G. P., & Foschi, R. (2003). The concept of personality in 19th-century French and 20th-century American psychology. *History of Psychology*, 6(2), 123ñ142. <https://doi.org/10.1037/1093-4510.6.2.123>
- Lombroso, C. (1909). *After death What?: Spiritistic phenomena and their interpretation*. Small, Maynard. <https://doi.org/10.1037/13627-000>
- London Dialectical Society. (1871). *Report on Spiritualism*. Longmans, Green, Reader & Dyer.
- Loveland, J. S. (1889). *Mediumship: A course of seven lectures*. Moses Hull.
- Lum, D. D. (1873). *The Spiritual delusion*. J. B. Lippincott.
- Macario, M. M. A. (1857). *Du sommeil des r ves et du somnambulisme dans l tat de sant et de maladie* [Dreams during sleep and somnambulism during the states of health and disease]. Perisse Fr rs.
- Mackenzie, W. (1923). *Metapsichica moderna* [Modern metapsychics]. Libreria di Scienze e Lettere.
- Magnin, E. (1903, April 1). Un bon m dium l'horizon [A good medium on the horizon]. *Revue Spirite: Journal d tudes Psychologiques*, 46(4), 232ñ235.
- Mais, C. (1814). *The surprising case of Rachel Baker, who prays and preaches in her sleep* (2nd ed.). Whiting and Watson.

- Maraldi, E. de O., & Alvarado, C. S. (2018). Classic Text No. 113: Final chapter, *From India to the planet Mars: A study of a case of somnambulism with glossolalia* by Thodore Flournoy (1900). *History of Psychiatry*, 29(1), 110-125. <https://doi.org/10.1177/0957154x17734782>
- Maraldi, E. de O., Ribeiro, R. N., & Krippner, S. (2019). Cultural and group differences in mediumship and dissociation: Exploring the varieties of mediumistic experiences. *International Journal of Latin American Religions*, 3(1), 170-192. <https://doi.org/10.1007/s41603-019-00076-0>
- Martineau, H. (1845). *Letters on mesmerism* (2nd ed.). Edward Moxon.
- Marvin, F. R. (1874). *The philosophy of spiritualism and the pathology and treatment of mediomania: Two lectures*. A. K. Butts.
- Mason, R. O. (1893, September). Duplex personality. *Journal of Nervous and Mental Disease*, 18(9), 593-598. <https://doi.org/10.1097/00005053-189309000-00001>
- Maxwell, J. (1905). *Metapsychical phenomena: Methods and observations* (trans. Laura I. Finch). Duckworth. [First published in French in 1903]
- Mayo, T. (1847). *Clinical facts and reflections: Also, remarks on the impunity of murder in some cases of presumed insanity*. Longman, Brown, Green, and Longmans.
- Mitchell, G. W. (1876). *X + Y = Z: or the sleeping preacher of North Alabama: Containing an account of most wonderful mysterious mental phenomena, fully authenticated by living witnesses*. W. C. Smith.
- Mitchill, S. L. (1817). A double consciousness, or a duality of person in the same individual. *Medical Repository of Original Essays and Intelligence Relative to Physic, Surgery, Chemistry, and Natural History*, 3(n.s., 2), 185-186.
- Moore, J. S. (1870). A case of somnambulism. *Medical Archives*, 4(6), 331-332.
- Moore, R. L. (1977). *In search of white crows: Spiritualism, parapsychology, and American culture*. Oxford University Press.
- Morin, A.-S. (1860). *Du magn tisme et des sciences occultes* [On magnetism and occult sciences]. Germer Bailli re.
- Morselli, E. (1908). *Psicologia e Spiritismo: Impressioni e note critiche sui fenomeni medianici di Eusapia Paladino* [Psychology and "Spiritism:" Impressions and critical notes about the mediumistic phenomena of Eusapia Paladino] (2 vols.). Fratelli Bocca.
- Moses, W. S. [under the pseudonym M. A. Oxon] (1879). *Spirit identity*. W. H. Harrison.
- M nsterberg, H., Ribot, T. A., Janet, P., Jastrow, J., Hart, B., & Prince, M. (1910). *Subconscious phenomena*. Richard G. Badger.
- Myers, F. W. H. (1884). On a telepathic explanation of some so-called spiritualistic phenomena: Part I. *Proceedings of the Society for Psychical Research*, 2(7), 217-237.
- Myers, F. W. H. (1885). Automatic writing. I. *Proceedings of the Society for Psychical Research*, 3(8), 1-63. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v4_29_october_1885.pdf
- Myers, F. W. H. (1886). Human personality in the light of hypnotic suggestion.

- Proceedings of the Society for Psychical Research*, 4(10), 1724. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v4_29_october_1885.pdf
- Myers, F. W. H. (1888). French experiments on strata of personality. *Proceedings of the Society for Psychical Research*, 5(13), 374-397. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v5_december_1888_supplement.pdf
- Myers, F. W. H. (1889). Professor Pierre Janet's 'Automatisme Psychologique.' *Proceedings of the Society for Psychical Research*, 6(15), 186-199. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v6_july_1889_supplement.pdf
- Myers, F. W. H. (1890). A record of observations of certain phenomena of trance (1) Introduction. *Proceedings of the Society for Psychical Research*, 6(17), 436-442. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v6_11_july_1890.pdf
- Myers, F. W. H. (1892). Review of *Les Altérations de la Personnalité*, by A Binet. *Mind*, 1(13), 417-421.
- Myers, F. W. H. (1902). On the trance-phenomena of Mrs. Thompson. *Proceedings of the Society for Psychical Research*, 17(44), 67-74. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v17_1901-3.pdf
- Myers, F. W. H. (1903). *Human personality and its survival of bodily death* (2 vols.). Longmans, Green.
- Newbold, W. R. (1898). A further record of observations of certain phenomena of trance. *Proceedings of the Society for Psychical Research*, 14(34), 67-49. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v14_1898-9.pdf
- Nias, H. (1999). *The artificial self: The psychology of Hippolyte Taine*. Legenda.
- Nicolas, S. (2002). *Histoire de la psychologie française* [History of French psychology]. Editions In Press.
- Nicolas, S., & Ferrand, L. (2002). Alfred Binet and higher education. *History of Psychology*, 5(3), 264-283. <https://doi.org/10.1037/1093-4510.5.3.264>
- Noel, R. (1885, November 28 & December 5). Spiritism versus other theories (being an answer to Messrs. von Hartmann, Myers, and Gurney). *Light*, 5(256), 587-588; (257), 599-600. http://iapsop.com/archive/materials/light/light_v5_nov_1885.pdf; http://iapsop.com/archive/materials/light/light_v5_dec_1885.pdf
- Ochorowicz, J. (1887). *De la suggestion mentale* [On mental suggestion]. Octave Doin.
- Ochorowicz, J. (1896). La question de la fraude dans les expériences avec Eusapia Paladino. *Annales des Sciences Psychiques*, 6(2), 79-123. http://iapsop.com/archive/materials/Annales_des_sciences_psychiques/Annales_des_sciences_psychiques_v6_1896.pdf
- Ochorowicz, J. (1909). Hypnotisme et mesmérisme. In C. Richet (Ed.), *Dictionnaire de Physiologie* (Vol. 8, pp. 709-778). Félix Alcan.
- Ochorowicz, J. (1910). Les rayons rigides et les rayons X^x [Rigid rays and X^x rays]. *Annales des Sciences Psychiques*, 20(7-8), 97-105; (9-10), 129-136; (11-12), 172-178; (13-14), 204-209; (15-16), 225-231; (17-18), 257-263; (19-20), 295-302; (21-22), 336-344; (23-24), 357-370. http://iapsop.com/archive/materials/Annales_

- [des_sciences_psychiques/Annales_des_sciences_psychiques_v20_1910.pdf](#)
- Oesterreich, T. K. (1923). *Occultism and modern science* [2nd German ed.]. McBride.
- Oesterreich, T. K. (1930). *Possession: Demoniacal and other*. Kegan Paul, Trench, Trubner. [Original work published in German 1921]
- Olivier, J. (1854). *Traité de magnétisme suivi des paroles d'un somnambule et d'un recueil de traitements magnétiques* [Treatise on magnetism followed by the words of a somnambulist and a collection of magnetic treatments]. Germer Baillière.
- Patrick, G. T. W. (1898, November). Some peculiarities of the second personality. *Psychological Review*, 5(6), 555-578. <https://doi.org/10.1037/h0073460>
- Peabody, J. R. (1838). *A world of wonders, or, divers developments, showing the triumph of animal magnetism in New England* (3rd ed.). Robert S. Davis.
- Perrier, A. (1854, February 10). Études et théories: Recherches médico-magnétiques. *Journal du Magnétisme*, 13(181), 65-80. http://iapsop.com/archive/materials/journal_du_magnetisme/journal_du_magnetisme_v13_1854.pdf
- Plas, R. (2000). *Naissance d'une Science Humaine: La Psychologie* [Birth of a human science: Psychology]. Presses Universitaires de Rennes.
- Podmore, F. (1902). *Modern Spiritualism: A history and a criticism* (2 vols.). Methuen.
- Prichard, J. C. (1835). Somnambulism and animal magnetism. In J. Forbes, A. Tweedie, & J. Conolly (Eds.), *The cyclopaedia of practical medicine* (Vol. 4, pp. 21-39). Sherwood, Gilbert, and Piper, and Baldwin and Cradock.
- Prince, M. (1890, May 15). Some of the revelations of hypnotism: Post hypnotic suggestion, automatic writing, and double personality. *Boston Medical and Surgical Journal*, 122(20), 463-467; (21), 493-495. <https://doi.org/10.1056/nejm189005151222001>
- Prince, M. (1914). *The unconscious: The fundamentals of human personality, normal and abnormal*. Macmillan.
- Purdon, J. E. (1889, January 26). Animal magnetism, and the supplementary working hypothesis of scientific spiritualism. *Religio-Philosophical Journal*, 45(23), 1, 8.
- Puységur, A. M. J., de C. (1784). *Mémoires pour servir à l'histoire et à l'établissement du magnétisme animal* [Memoires for the history and establishment of animal magnetism]. No publisher.
- Raymond, F., & Janet, P. (1908). *Neuroses et idées fixes* [Neuroses and fixed ideas] (2nd ed., Vol. 2). Félix Alcan.
- Ribot, T. (1885). *Les maladies de la personnalité* [The diseases of personality]. Félix Alcan.
- Richet, C. (1883, March). La personnalité et la mémoire dans le somnambulisme [Personality and memory in somnambulism]. *Revue Philosophique de la France et de l'étranger*, 15, 225-242. <https://www.jstor.com/stable/41074407>
- Richet, C. (1884, December). La suggestion mentale et le calcul des probabilités [Mental suggestion and the calculation of probabilities]. *Revue Philosophique de la France et de l'étranger*, 18, 609-674. <https://www.jstor.com/stable/41072311>

- Richet, C. (1886). Les mouvements inconscients [Unconscious movements]. In M. Berthelot (Ed.), *Hommage Monsieur Chevreul a l'occasion de son centenaire* 31 Aut 1886 (pp. 79-94). F. l'ix Alcan.
- Richet, C. (1889, July 8). Further experiments in hypnotic lucidity or clairvoyance. *Proceedings of the Society for Psychical Research*, 6(15), 66-83. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v6_8_july_1889.pdf
- Richet, C. (1922). *Traité de métapsychique* [Treatise of metapsychics]. F. l'ix Alcan. http://iapsop.com/ssoc/1922_richet_traite_de_metapsychique.pdf
- Ritti, A. (1891). Mort de M. le Dr. Baillarger [Death of M. Dr. Baillarger]. *Annales Médico-Psychologiques*, 13(s. 7), 161-68.
- Rogers, E. C. (1853). *Philosophy of mysterious agents, human and mundane* J. P. Jewett.
- Sandby, G. (1850, January). Review of M. Alphonse Cahagnet's *Arcanes de la Vie Future* *Dvoilés, &c.* *Zoist*, 7(28), 414-431. http://iapsop.com/archive/materials/zoist/zoist_v7_n28_january_1850.pdf
- Schrenck-Notzing, A. F. von. (1920). *Physikalische Phaenomene des Mediumismus* [The physical phenomena of mediumship]. Ernst Reinhardt.
- Sidgwick, H. (1895, November). Eusapia Paladino. *Journal of the Society for Psychical Research*, 7(123), 148-59. http://iapsop.com/archive/materials/spr_proceedings/spr_journal_v7_1895-6.pdf
- Sidgwick, Mrs. H. [E. M.]. (1915). A contribution to the study of the psychology of Mrs. Piper's trance phenomena. *Proceedings of the Society for Psychical Research*, 28(71), 1-657. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v28_1915.pdf
- Sidis, B. (1898). *The psychology of suggestion: A research into the subconscious nature of man and society*. D. Appleton. <https://doi.org/10.1037/10578-000>
- Smith, J. E. (1837). *Legends and miracles, and other curious and marvellous stories of human nature, collected from scarce works and ancient records*. (No. 8). B. D. Cousins.
- Somers, A. N. (1893, May). The double personality, and the relation of the submerged personality to the phenomena of modern spiritualism. *Psychical Review*, 1(4), 314-323. http://iapsop.com/archive/materials/psychical_review/psychical_review_v1_n4_may_1893.pdf
- Sudre, R. (1926). *Introduction à la métapsychique humaine* [Introduction to human metaphysics]. Payot.
- Sudre, R. (1946). *Personnages d'au-delà*. Société des éditions de No. l.
- Taine, H.-A. (1878). *De l'intelligence* [About intelligence] (Vol. 1, 3rd rev. ed.). Hachette.
- Tanner, A. E. (1910). *Studies in Spiritism*. D. Appleton.
- Tascher, P. (1855). *Seconde lettre de Grosjean son évêque au sujet de tables parlantes, des possessions, des sibylles, du magnétisme et autres diableries* [Grosjean's second letter to his bishop about talking tables, possessions, sybils, magnetism, and other devilry]. Ledoyen.
- Taves, A. (1999). *Fits, trances, and visions: Experiencing religion and explaining experience from Wesley to James*. Princeton University Press.

- Taylor, E. (1983). *William James on exceptional mental states: The 1896 Lowell Lectures*. Charles Scribner's Sons.
- Taylor, E. (2009). *The mystery of personality: A history of psychodynamic theories*. Springer.
- Taylor, W. S., & Martin, M. F. (1944, July). Multiple personality. *Journal of Abnormal Psychology*, 39(3), 281-300. <https://doi.org/10.1037/h0063634>
- Thomas, C. D. (1922). *Some new evidence for human survival*. W. Collins Sons.
- Titchener, E. B. (1915). *A beginner's psychology*. Macmillan.
<https://doi.org/10.1037/11238-000>
- Treitel, C. (2004). *A science for the soul: Occultism and the genesis of the German modern*. John Hopkins University Press.
- Troubridge, U. (1922). The *modus operandi* in so-called mediumistic trance. *Proceedings of the Society for Psychical Research*, 32(84), 344-378.
- Tymn, M. E. (2013). *Resurrecting Leonora Piper: How science discovered the afterlife*. White Crow Books.
- Van der Hart, O., & Horst, R. (1989, October). The dissociation theory of Pierre Janet. *Journal of Traumatic Stress*, 2(4), 397-412. <https://doi.org/10.1002/jts.2490020405>
- Vencio, S., Caiado-Vencio, R., & Caixeta, L. (2018). Differential diagnosis between anomalous experiences and dissociation disorder using the Dissociative Disorders Interview Schedule (DDIS). *Journal of Trauma and Dissociation*, 20(2), 165-178. <https://doi.org/10.1080/15299732.2018.1502715>
- Verrall, Mrs A. W. [M.]. (1906). On a series of automatic writings. *Proceedings of the Society for Psychical Research*, 20(53), 1-432. http://iapsop.com/archive/materials/spr_proceedings/spr_proceedings_v20_1906.pdf
- Viollet, M. (1908). *Le Spiritisme dans ses rapports avec la folie: Essai de psychologie normale et pathologique* [Spiritism and its relation with madness: Essay of normal and pathological psychology]. Bloud.
- Visani Scozzi, P. (1901). *La medianit* [Mediumship]. R. Bemporad & Figlio.
- von Hartmann, E. (1885). *Spiritism*. Psychological Press.
- Walusinski, O. (2014). Biographies des internes de Jean-Martin Charcot - La Salpêtrière entre 1862 et 1893 [Biographies of the interns of Jean-Martin Charcot at La Salpêtrière between 1862 and 1893]. http://baillement.com/internes/internes_index.html
- Weaver, Z. (2019, June). Julian Ochorowicz and his contribution to psychical research. *Journal of Parapsychology*, 83(1), 69-78.
- Wolf, S. (1993). *Brain, mind, and medicine: Charles Richet and the origins of physiological psychology*. Transaction Publishers.
- Wolf, T. H. (1973). *Alfred Binet*. University of Chicago Press.
- Wolffram, H. (2009). *The stepchildren of science: Psychical research and parapsychology in Germany, c. 1870-1939*. Rodopi. <https://doi.org/10.1163/9789042027299>

OBITUARY

A Parapsychological Naturalist[†] A Tribute to Mary Rose Barrington (January 31, 1926–February 20, 2020)

BY ZOFIA WEAVER

<https://doi.org/10.31275/20201845>
Creative Commons License CC-BY-NC



Mary Rose Barrington was born in London; her parents were Americans with Polish-Jewish roots who decided to settle in England. By her own account (she very considerably left a biographical note for her obituary writer), her childhood was idyllic, mostly spent riding her pony and playing tennis, as well as reading her older brother's science fiction. Later she became interested in classical music (she was an accomplished musician, playing cello in a string quartet and singing alto in a local choir) and in poetry, obtaining a degree in English from Oxford University. She then studied law, qualified as a barrister and a solicitor, and spent most of her professional life as a lawyer; her duties included acting as charity administrator for a large group of almshouses.

Having a career in the law helped in pursuing two interests of special significance to her, animal protection and the right to voluntary euthanasia. She was responsible for drafting three parliamentary Bills relating to these subjects; none of them passed, but they produced some useful discussions.

However, her main interest was in psychical research. When she was 15 she read Sir Oliver Lodge's *Survival of Man*, and at Oxford she joined the Oxford University Society for Psychical Research, at that time

headed by the philosopher H. H. Price and run by Richard Wilson, later a physics professor at Harvard. The society was very active and hosted knowledgeable invited speakers such as Robert Thouless, Mollie Goldney, and Harry Price. Eventually Mary Rose herself became the Oxford society's President.

She became a member of the London Society for Psychical Research (SPR) in 1957, and Guy Lambert, joint Honorary Secretary at that time, would often take her along on poltergeist investigations, and instruct her in the art of looking for natural causes of the phenomena, such as cracks in buildings and underground water. However, her all-time favorite poltergeist investigation was the 'flying thermometer' case where, while the initial and central event was not spectacular, the subsequent events she followed over a number of years led her to the idea of "thwarted creativity" in the family relationships being a factor in the phenomena, a theme she observed in a later poltergeist case she investigated with Maurice Grosse (Barrington, 1965–1966, 1969, 1976; Barrington & Grosse, 2001).

She was elected to the SPR Council in 1962 and, in association with George Medhurst, and later John Stiles and other members of the ESP Committee, she devised or cooperated in a number of experiments. They included sheep/goat testing (using the Monte Carlo statistical method to assess the outcome), a remote viewing experiment, a chair test using six scripts as cross-controls, and a telepathy experiment using ambiguous drawings.

Her main focus, however, was on spontaneous cases and the evidence for the paranormal provided by outstanding mediums and psychics; this was essentially historical research, since she did not personally encounter such individuals. The one exception was Matthew Manning, who suddenly produced in her presence a large-scale effect on an infrared beam in the course of experiments at the City University in London in the 1980s. In that instance, Mary Rose played the role of an unwitting catalyst, when she irritated him by remarks intended to console and, according to her, he took out his frustration on the beam instead of on her (Barrington, 2019, pp. 188–189).

In fact, she was a remarkably positive catalyst in many ways and in many lives. A Vice-President of the SPR from 1995, she was very unassuming and self-deprecating when it came to assessing the value

of her ideas and contributions, and I don't think she had any idea of just how much she had achieved and how much she mattered as a person to those who knew her. Perhaps it was her openness to people, to concepts, and to the world that made her so oblivious to her own worth. Fluent in French and German (Peter Mulacz reports that in 1999 she gave a lecture in impeccable German to the Austrian Society for Psychical Research), over the years she provided the readers of the SPR's *Paranormal Review* with ninety "Archives" articles on the history of psychical research and its main figures. Many of us were introduced to the subject through Mary Rose's informal experiments (which traditionally involved a break for tea), and the study days and discussion groups she organized. Indefatigable researcher, she studied the cases that came her way with the perseverance and attention to detail worthy of Edmund Gurney and Frederic Myers, as in the puzzling story of Iris Farczady (where a totally new personality speaking a different language seemed to take permanent possession of the body of a young girl involved in mediumship), which she investigated with Peter Mulacz and Titus Rivas (Barrington et al., 2005a). Judging by the response to my request for reminiscences of Mary Rose, it seems that those of us who were lucky enough to work with her and exchange ideas with her remained friends with her for life.

I was fortunate to have worked with her on a project very dear to her heart, a book on the Polish clairvoyant Stefan Ossowiecki, which she wrote in collaboration with the late Ian Stevenson and myself, entitled (Ian Stevenson's happy choice) *A World in a Grain of Sand* (Barrington et al., 2005b). In her own chapter in that book, "Answers and Questions," she put forward her view that Ossowiecki's clairvoyance was effected by retrocognition, and that this implied the persistence of the past in a cosmic memory, and a memory implied the existence of a universal mind.

This view fitted in with the evidence she collected for the existence of JOTT, her acronym for the seemingly trivial Just-One-of-Those Things, when objects seem to disappear and sometimes reappear in inexplicable ways. Despite the rather dismissive nomenclature, she took JOTT seriously, as a collective name for various kinds of spatial discontinuity, and perhaps making the case for the inclusion of such phenomena in the "bigger picture" of reality may turn out to be her

most important achievement. She felt that well-authenticated JOTT supported the idealist philosophy of George Berkeley that the universe and its inhabitants were thoughts in the mind of what Bishop Berkeley called God, although she described the entity responsible for “reality maintenance” in less exalted terms as the Environmental Control (Barrington, 2019, p. 176).

However, being a true parapsychological naturalist, Mary Rose was more concerned with non-conforming facts than theory-building she called hers “a small theory of everything” (Barrington, 2019, pp. 163–185). One could say that she was pushing the envelope out in both directions: seeing a deeper meaning in everyday events that usually go unnoticed on the one hand and, on the other, championing evidence for macro-events that goes beyond many people’s boggle threshold if she found it compelling. She produced incisive point-by-point responses to destructive and fanciful modern appraisals of research reports from the past, such as Richard Wiseman’s reinterpretation of the Feilding et al. sittings with Eusapia Palladino (Barrington, 1992) or Michael Coleman’s attack on Gustave Geley’s competence and integrity in the matter of Franek Kluski’s hand moulds, which she described as “scraping the barrel of speculation” (Barrington, 1994, p. 106).

It is not uncommon and quite natural to veer toward facile and simplistic explanations when faced with quite outrageous phenomena that defy common sense. However, for Mary Rose such an approach was not acceptable, since every case had to be established on its own merits, while reports of all kinds, including those relating to scientific facts, in the final analysis depended on the testimony being trustworthy and as full as possible. As she put it, “That atoms fit into a coherent system and materialisations appear to conflict with that system is not a good argument for rejecting good testimony” (Barrington, 2013, p. 12).

It was her abiding interest in the phenomena produced by two Polish psychic virtuosi, the clairvoyant Stefan Ossowiecki and Franek Kluski, an extraordinary physical medium, that shaped my involvement in psychical research from the day I first met Mary Rose at an SPR Study Day many years ago. Ever eager for more information that only Polish sources could provide, Mary Rose spurred me on, pushing me over my boggle threshold and making my intellectual life much more fun in the process. As some of us know from experience, working with her

and talking to her was a delight. A cherished friend, at the end she was at peace with herself, leaving behind a body of valuable and highly readable writings, happy memories, and the heartfelt gratitude of many for having had her with us.

NOTE

- ¹ This is Stephen Braude's very apt title of his review (Braude, 2019) of Mary Rose's book: *JOTT: When Things Disappear . . . and Come Back or Relocate and Why It Really Happens* (Barrington, 2018).

REFERENCES

- Barrington, M. R. (1965/1966). The case of the flying thermometer. *Journal of the Society for Psychical Research*, 43, 11-20.
- Barrington, M. R. (1969). Further report on the flying thermometer case. *Journal of the Society for Psychical Research*, 45, 149-161.
- Barrington, M. R. (1976). A poltergeist revived: The flying thermometer case again. *Journal of the Society for Psychical Research*, 48, 293-297.
- Barrington, M. R. (1992). Palladino and the invisible man who never was. *Journal of the Society for Psychical Research*, 58, 324-340.
- Barrington, M. R. (1994). Kluski and Geley: Further case for the defence. *Journal of the Society for Psychical Research*, 60(837), 104-106.
- Barrington, M. R. (2013). Beyond the boggle threshold: Confessions of a macro-addict. In R. Pilkington (Ed.), *Men and women of parapsychology. Personal reflections. ESPRIT*, Vol. 2, 7-27. Anomalist Books.
- Barrington, M. R. (2018). *JOTT: When things disappear . . . and come back or relocate And why it really happens*. Anomalist Books.
- Barrington, M. R. (2019). *Talking about psychical research: Thoughts on life, death and the nature of reality*. White Crow Books.
- Barrington, M. R., Mulacz, P., & Rivas, T. (2005a, April). The case of Iris Farczd y: A stolen life. *Journal of the Society for Psychical Research*, 69(2), 44-77.
- Barrington, M. R., Stevenson, I., & Weaver, Z. (2005b). *A world in a grain of sand: The clairvoyance of Stefan Ossowiecki*. McFarland.
- Braude, S. E. (2019, June). A parapsychological naturalist. Book review of *JOTT: When things disappear . . . and come back or relocate And why it really happens* by Mary Rose Barrington. *EdgeScience*, 38, 11-12.
- Grosse, M., & Barrington, M. R. (2001). Report on psychokinetic activity surrounding a seven-year-old boy. *Journal of the Society for Psychical Research*, 65, 207-217.

LETTER TO THE EDITOR

Quantum Turbulence

KOSTAS DAVANAS

Ministry of Transport, Saint Stephen, Greece
053aib@otenet.gr

DOI: 10.31275/20201825
Creative Commons: CC-BY-NC

Last year, in an article in the *JSE*, Lear (2019) elaborated on the debate/literature about the ongoing mysteries of non-locality and causality in the quantum world by addressing, in a novel way (among other issues), the “classical” enigma of particle entanglement and “spooky action at a distance” via the so-called collapse of the wave-function. Invoking the collapse of the wave-function brings up the role of measurement in the process, a matter that herein is further elaborated/addressed from an alternative (than it appears in the literature) point of view since it is potentially of significant importance when trying to explore the mysteries of the quanta.

In line with the wide-spectrum nature/audience and interdisciplinary approach of the *JSE*, the work by Felder (1999) will be followed because, albeit simplified (e.g., in the eyes of a professional physicist), it contains the necessary mathematics, at a non-advanced level, to be accessible to a wide readership both from a qualitative (“popular science”) and a quantitative (“equations-having”) point of view.

Thus, following Felder (1999), one sees that when pairs of entangled particles are shot in opposite directions and then a (binary) property of theirs is measured by trimodal detectors (i.e. measuring devices independently and continuously and randomly being set at any one of only three configurations) that are positioned very far apart from each other (so that the entangled particles cannot communicate without exceeding the speed of light, i.e. an “impossible” affair), the detectors’ measurement streams (Aspect et al., 1982a, 1982b) do not (statistically)

correspond to each other at least in 5/9ths of the time (as expected by classical reckoning, i.e. Bell's [1964] inequality), but instead correspond only 50% of the time (as calculated by the "exotic" equations of quantum mechanics which allow for instant communication between any two points in the universe via the instantaneous collapse of the wave-function throughout the cosmos). This so-called "non-locality," or as Lear (2019) prefers it "nonlocal causality," implies that each detector's measurement traverses instantly the entire world (how this may be done constitutes a deep mystery).

To make a measurement, a detector must somehow interact with a target (e.g., one of the particles of an entangled pair) even if there is "nothing" in between them. But according to state-of-the-art physics, it does seem that there is a very good chance that there is no such thing as nothingness or absolute void or emptiness and the like (Laughlin, 2005; Silk, 2005; Yiu, 2017; Koga & Hayakawa, 2017). Thus, in spite of the "disproof" of the ether back in the 19th century, and if the word "medium" would better be avoided due to its negative connotations (*vis-à-vis* the ether), it has still to be admitted (referring to the quantum realm) that during the interaction between detector and target the "fabric" of the *involved (in the interaction)* micro-cosmos (whether it be the unremittingly fluctuating quantum vacuum or whatever else) might, or most probably shall, get perturbed and this might, as well, affect any subsequent measurements (and/or targets) if the "fabric" (as "middleman") is not allowed to "relax." If that is indeed true, then via a detector's continuous random trimodal changeovers, in the afore-defined "fabric" (or, more accurately, in the detector-target "fabric" ensemble), either some kind of pattern will be established or some sort of "turbulence" will set in. In the latter case, the obvious outcome of any (statistical) examinations/comparisons of the data streams of the two far-away detectors will be a 50% correspondence as actually measured experimentally (nothing spooky here, it is like statistically examining/comparing the toss sequences/streams of two coins at two different sites no matter if they are separated by meters or parsecs); in the former case, descriptive equations must (at least in principle) be possible to be derived, which upon solution shall give the probability of correspondence of the data streams of the two detectors.

Such a rationale can actually be employed to the well-known

“double-slit experiment” (e.g. Al-Khalili, 2013) as well: When there is no detector to count how many particles go through one of the slits, an interference pattern develops; otherwise, perhaps due to the perturbation of the (afore-defined) “fabric,” when a counting detector is functioning, a two-zone pattern appears.

Therefore, a more detailed look at the (quantum or otherwise) vacuum (alias “fabric”) and its role as the “middleman” of interactions may be in order; at least to tackle any relevant “loopholes” in Bell (1964) test experiments and (any) ambiguities about “hidden variables” of entangled particles (Einstein et al., 1935); moreover, to probe whether this detector-target-via-“fabric” interaction inflicts any kind of alteration (reversible or irreversible) on the target itself.

REFERENCES

- Al-Khalili, J. (2013). The double slit experiment Royal Institution video.
www.youtube.com/watch?v=AgtKncAdlHQ
- Aspect, A., Grangier, P., & Roger, G. (1982a, July 12). Experimental realization of Einstein-Podolsky-Rosen-Bohm *gedankenexperiment*: A new violation of Bell's inequalities. *Physical Review Letters*, 49(2), 91-94.
<https://doi.org/10.1103/PhysRevLett.49.91>
- Aspect, A., Dalibard, J., & Roger, G. (1982b, December 20). Experimental test of Bell's inequalities using time-varying analyzers. *Physical Review Letters*, 49(25), 1804-1807. <https://doi.org/10.1103/PhysRevLett.49.1804>
- Bell, J. S. (1964). On the Einstein Podolsky Rosen paradox. *Physics*, 1(3), 195-200.
<https://doi.org/10.1103/PhysicsPhysiqueFizika.1.195>
- Einstein, A., Podolsky, B., & Rosen, N. (1935, May 15). Can quantum-mechanical description of physical reality be considered complete? *Physical Review*, 47(10), 777-780. <https://journals.aps.org/pr/abstract/10.1103/PhysRev.47.777>
- Felder, G. (1999). Spooky action at a distance – An explanation of Bell's theorem.
www.felderbooks.com/papers/bell.html
- Koga, J. K., & Hayakawa, T. (2017, May 17). Possible precise measurement of Delbrück scattering using polarized photon beams. *Physical Review Letters*, 118, 204801. <https://doi.org/10.1103/PhysRevLett.118.204801>
- Laughlin, R. B. (2005). *A different universe: Reinventing physics from the bottom down*. Basic Books.
- Lear, C. W. (2019, March). The case for advance wave causality. *Journal of Scientific Exploration*, 33(1), 61-72. <https://doi.org/10.31275/2019.1232>
- Silk, J. (2005). *On the shores of the unknown: A short history of the universe*. Cambridge University Press.
- Yiu, Y. (2017). A study about nothing. www.insidescience.org/news/study-about-nothing

LETTER TO THE EDITOR

Flying Friars and Other Exceptions

MICHAEL GROSSO

DOI: [10.31275/20201885](https://doi.org/10.31275/20201885)

Creative Commons: CC-BY-NC

Stephen Braude’s Editorial “Does Telepathy Threaten Mental Privacy” (Braude, 2020) speaks to one reason some people might resist accepting the reality of paranormal abilities. It is somewhat of a puzzle why so many otherwise rational people shy away from psi. The fear may be that if we accept telepathy, it might seem we’re exposed to others snooping on our innermost secrets and intentions. Deploying a distinction made by C. D. Broad between telepathic cognition and telepathic interaction, Braude argues that our fear of telepathic intrusion is greatly exaggerated. I, for example, often think of someone just before he or she calls on the phone. When that happens, I have no knowledge of what the caller is going to tell me. No cognition, just a bit of interaction. Telepathic connection doesn’t necessarily imply telepathic cognition. No danger of your hidden self being exposed in most common forms of telepathy.

There are, however, some examples where it looks like real telepathic cognition comes into play. In the early stages of 17th-century Joseph of Copertino’s career as a priest, his superiors had to ask Joseph to desist from calling out the brothers in public for every peccadillo they committed. In a typical example cited, he embarrassed a brother for thinking about eating cherries and other things while saying his prayers. His superiors urged Joseph to be more discreet and say things like “you need to adjust your moral compass.” Joseph did learn to be more discreet, but his *Vita* shows him repeatedly tuning into the specifics of other minds. For example, he was able to distinguish persons who came merely to observe him out of curiosity (Grosso, 2017, 2016). Let me quote one sworn deposition from a Brother Francesco that illustrates telepathic cognition:

I know from experience that Padre Giuseppe had a gift from God to know the inner workings of souls. In fact, when I first went to speak with him, without ever having met me, he told me point by point everything about my life, both things of the present and things of the past, but especially things he had seen within my soul. Such things could not possibly be known by anyone except God himself. And everything that he told me was true; and he told me other things that would happen in the future and that indeed did happen. (Grosso, 2016, p. 96)

Several Catholic saints were famous for their telepathic performances in the confessional booth. The most recent example is Padre Pio, recently canonized, and famous for his fifty-year stigmata and also for his supernormal prowess as confessor (Ruffin, 2018). The novelist Graham Greene backed off from a chance to meet the Padre because he was having an illicit affair with a woman he preferred to keep secret. On one occasion the Padre was listening to a man's confession when the Padre suddenly shouted quite out loud: "Murderer!" The man fled but soon returned, and this time openly confessed he had been tempted to murder his wife. A German Lutheran convert, Friedrich Abresch, had his conscience blown confessing to the Padre and deposed:

He concealed his knowledge of my entire past under the form of questions. He enumerated with precision and clarity all of my faults, even mentioning the number of times I had missed Mass. I was completely bowled over at hearing things I had forgotten, and I was able to reconstruct that past by remembering in detail all the particulars that Padre Pio had described with such precision. (Ruffin, 2018, p. 236)

According to this account, one man was able to recollect in a coherent fashion memories forgotten by another man, a feat that might strike some as necessarily demanding divine intervention. In light of what some gifted mental mediums like Mrs. Piper can do, however, the God hypothesis might be in need of modification. Still, Braude is

correct in his conclusion not to worry about your dirty secrets being revealed. That is, as long as you don't see any bearded friars flying around outside your window.

REFERENCES

- Braude, S. E. (2020, June). Does telepathy threaten mental privacy? [Editorial]. *Journal of Scientific Exploration*, 34(2), 199–208.
- Grosso, M. (2016). *The man who could fly: St. Joseph of Copertino and the mystery of levitation*. Rowman & Littlefield.
- Grosso, M. (2017). *Wings of ecstasy: Domenico Bernini's life of St. Joseph of Copertino (1722)*. CreateSpace.
- Ruffin, C. B. (2018). *Padre Pio: The true story*. Our Sunday Visitor.

BOOK REVIEW

Lost Civilizations: The Secret Histories and Suppressed Technologies of the Ancients by Jim Willis. Visible Ink, 2019. 624 pp. ISBN13: 978-1578597062.

REVIEWED BY JOHN B. ALEXANDER

<https://doi.org/10.31275/20201813>

Creative Commons License CC-BY-NC

Lost Civilizations is at once intriguing but also challenging to conventional wisdom. Perhaps that is as it should be, and Willis certainly has created an interesting compendium of mysterious archaeological events combined with a generous exploration of mythology.

Readers of SSE's *Journal of Scientific Exploration* should know I am not a fan of the "Out of Africa" theory. There have been too many recent discoveries made, to support the notion that human life began in a single remote location. We can think of the discovery of the Denisovan that interbred with hominids who did migrate from Africa. What Willis repeatedly points to is apparent DNA anomalies in which samples indicate connections between groups for which there is no logical explanation. As an example, there are traces in Australia that are commensurate with those from South America that must have occurred long before any known contact had happened.

While Willis would agree, *Lost Civilizations* suggests the timelines may be off by many thousands of years, a concept that is hard to integrate into demonstrable history. If somebody built things, where did such previously unknown groups come from? It is in questioning that Willis adds significant value. What we mean by "lost civilizations" is basic to the book. But more fundamentally, he asks how is "civilization" defined? There are multiple definitions, and he states that what it means to be civilized does not equate to the organization of villages or cities.

Further, if civilizations were "lost," where did they come from and

where did they go? How did seemingly thriving communities suddenly cease to exist? Then, why is it that some societies not only physically disappear, but also seem to be erased from the memories of survivors or other groups that may have interacted with them. His examples of lost groups abound and signal a warning to modern society. If previous complex organizations disappeared, often with no immediate trace, could the same thing happen to our current civilization?

We know that the relatively recent discoveries of Goebekli Tepe offer a huge challenge for conventional archaeology. First reported in 1963, the site contains large stone structures with glyphs carved into the columns and may be twelve thousand years old (thus predating the Egyptian pyramids by more than seven thousand years). Yet, there is no record of what culture made them; where did they come from and where did they go? The development may parallel an event that occurred eleven thousand two hundred years ago that ushered in what is known as the Younger Dryas. The Younger Dryas was a period annotated by sudden geophysical changes including rapid rise in ocean levels and onset of an ice age.

Willis explores several alternative scenarios including terrestrial cataclysms and astronomical events such as collision with large bodies possibly a meteor or coming into the gravitational influence of a previously unknown extremely large object. He does note that climate change may have led to the demise of some cultures as is suspected with the Anasazi in the southwestern United States. When coupled with population growth, he notes that the confluence stresses the agricultural capability to meet the needs.

Interestingly, he speculates that wealth disparity and inequities cannot be sustained and has led to the devolution of prior societies. Without the author saying it, his commentary is a fair geopolitical analysis of what is happening to our society. He points to the epic tales of Gilgamesh as an example that suggests the past may be a prologue and worthy of serious consideration.

Willis suggests that studying mythology is a worthy effort but that present archaeologists eschew it for lack of physical evidence. Nonetheless, while specific details may vary, there are often core elements that transcend time and space. In fact, he asks how is it that the fundamental components are recorded despite being attributed to

societies separated by oceans. Of particular interest are the common themes found in myths of origin of the human species and interaction with beings accredited as “gods.”

Then, too, there is controversy about whether or not a civilization disappeared as proclaimed in folklore. One example might be the supposed extinction of the Maya. That belief is popularly held today. Yet, when we traveled throughout the area they had inhabited, the current residents noted that they were, in fact, the descendants of the original Maya. As they told us, “We are here and didn’t go anywhere.” What is certainly true is that there is much to learn about the prior culture. Using satellite archaeology and advanced foliage penetrating technologies, we see that the size and scope of their civilization was far greater than previously thought.

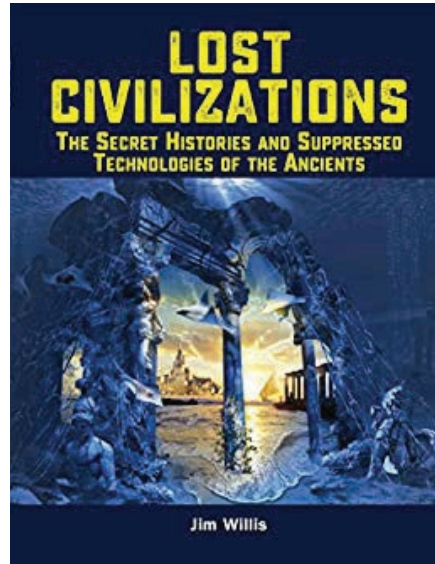
Willis draws on the works of a wide variety of experts. They range from very credible scholars to neophytes and dilettantes who are highly speculative at best. And as a theologian, he liberally intersperses the text with religious references.

Where Willis is correct is his analysis that there is a strong bias in academia in favor of status quo. On page 70 he states, “Unfortunately, Egyptologists, like well-entrenched professionals everywhere, tend to pull their wagons into a circle whenever they feel threatened.” He also noted that most universities do not support mavericks in hiring and certainly not in tenure. There are many SSE members who can attest to those issues.

An extreme example of such bias was experienced by Stephan Schwartz using remote viewing in triple-blind archaeological experiments in Egypt. There, he caught the monitoring Egyptologist moving stakes placed by his remote viewers the day before. Though no excavation had occurred and nothing yet located, the monitor deemed it necessary to alter the site just in case the information proved to be accurate. Nothing was going to be allowed that did not comport with established doctrine. The entire story can be found in Schwartz’s book *The Alexandria Project* and supports the problems encountered by those with evidence contrary to conventional wisdom.

Lost Civilizations does have sections covering the entire world including Antarctica. There Willis addresses the well-known Piri Reis map that purported to show the actual outline of the continent which is

now covered in ice. The idea is that it was made at a time before the ice had formed which would have been many thousands of years ago. Selectively he has chosen examples that fit his hypothesis that history is wrong (and he is probably right). There could be several volumes if all anomalies were included. He did not address one of my favorites, that of Ollantaytambo in Peru. There, massive stones were cut and transported five kilometers and up a substantial cliff by an unknown mechanism.



Then there is Sacsayhuaman that offers similar puzzlements. In the sprawling Matta Grosso region in the center of the continent, there recently have been indications of quite large urban areas that have yet to be fully explained. The point is that there is credible evidence to indicate the conventional theories of history are at least incomplete.

As a major section of the book, the importance of mythology in consideration of past technology, civilizations, and cultures is discussed by Willis. Appropriately he notes that almost all societies have stories of their origin, such as the concept of Eden in the Old Testament of the Bible. While there are differences, there are many similarities as well. These point to a common basis in fact, even if the cultural details vary.

He goes so far as to include the “Big Bang Theory” as a creation myth of physicists. In an interview with an unidentified physicist (PP), that person states,

We don't know why. We don't even think about why. We leave that to philosophers and (shudder) theologians and mystics. Some of us, maybe even most of us, don't think 'why' is a consideration. It just happened, that's all.

That response sure sounds like a myth.

Human fascination with flight deservedly gains attention. From flying carpets to vimanas, associated with Zarathustra/Zoroaster, Willis includes many accounts of airborne craft, and tangentially mentioned are the wars written about in the Upanishads replete with armed military warships. Others have speculated that nuclear weapons may have been employed in existential conflicts between the gods. While this short chapter is intriguing, there is probably enough material for an entire book but there are time and space constraints on any manuscript.

Rightfully, there is discussion about the most fabled “lost continent” of all, Atlantis. Admittedly, the possibility of pre-cataclysmic civilizations has long been an interest of mine. So much so that I dived the area off the Bahamas photographing some very captivating artifacts that lie in the shallow waters there. Mentioned by Plato, repeatedly the location of Atlantis has been the subject of great speculation. But that is hardly the only hidden area. Mentions here include the possibility of Lemuria or Mu located somewhere in the Pacific (or maybe the Atlantic). A new one for me was the description of Cascadia, and a large sunken land mass in the Pacific Northwest.

In addition to submerged civilizations, Willis writes about those that may be underground. Correctly he notes that the legends of some First Nation people have them emerging through a tunnel from underground. He does cover known subterranean structures as well. Included is Cappadocia, a truly fascinating site we have visited in central Turkey. These sites were usually designed to evade would-be conquerors, but could accommodate a large community numbering in the thousands of people.

There is a brief section on Joseph Smith and the development of doctrine for the Church of Jesus Christ of the Latter-Day Saints. Here, Willis admits to being a “Mormon detractor” and reports having studied extensively Smith’s history; he does state that the *Book of Mormon* could not have been written “without spiritual help of some kind.”

Other myths include the tales of Quetzalcoatl of the Aztecs, the Norse legends of Ragnarok, and the famous female warriors, the Amazons. Taking a bigger leap, the author explores the “Reptilian Hypothesis,” noting that a poll taken in 2013 found that four percent of those responding “endorsed a notion that reptilian people control the world . . . and are gaining power.”

Willis ends by asking if we could be the next lost civilization. Meaning, is it possible that our current civilization could disappear with minimal, if any, trace of prior existence? In that section he asks several poignant questions, ones that have been the foundations of philosophy from time immemorial:

- Who are we?
- What gives our life meaning?
- Where did we come from?
- When did we begin our journey?

Obviously, he does not provide answers and leaves it to readers to address those complex issues.

In the end, *Lost Civilizations* will challenge what you think you know about ancient history while simultaneously pushing credulity. It is worth reading, but not to the exclusion of known facts and common sense.

BOOK REVIEW

The Paranormal Surrounds Us: Psychic Phenomena in Literature, Culture, and Psychoanalysis by Richard Reichbart. McFarland & Company, 2019. 242 pp. ISBN 978-1-4766-3368-8.

REVIEWED BY JAMES CARPENTER

<https://doi.org/10.31275/20201799>

Creative Commons License CC-BY-NC

The Paranormal Surrounds Us is a tied-together collection of essays by Richard Reichbart, a practicing psychoanalyst whose several strong interests and lifelong love for the mystery of psi, and sense of adventure and ethical sensibility, give the collection several points of focus. Besides his current analytic practice of many decades, he has also been a student of literature, a playwright, a Yale-trained attorney, and an activist for Native American and African American rights. The book is as scattered as he has been, but it is so full of insights and pleasing prose, that it doesn't lose much for that. In this time when we prefer our intellectual material in bite-sized chunks, like sparky TED Talks and Internet articles, this may feel especially friendly to many. If there is an underlying focus to the work, it may be implicitly biographical: one curious man's study of, to paraphrase Freud, the vicissitudes of psi—its expression in our finest literature, in our private and shared unconscious processes, in our different subcultures, in the deepest privacy of intensive psychotherapy, and in the legal and cultural presumptions that implicitly structure our thinking and behavior.

There are three main sections to the book: Psi Phenomena in Western Literature, Psi Phenomena and Psychoanalysis, and Psi Phenomena and Culture.

It is the first part that I personally find most fresh and intriguing. I have long marveled at *Hamlet*, and will sometimes spill out some appropriate lines with tolerant therapy patients of my own, but I had long ago decided that I never needed to read another word about the

play. Wrong. Reichbart's treatment of *Hamlet* is delightfully original and, to me, compelling. Spoiler: Shakespeare was a parapsychologist of his day, and this play is a parapsychological experiment disguised in plain sight. Some will not be as convinced as I, but many readers will enjoy such a fresh take on a hoary old subject. His general thesis across these chapters is that many of our literary masters were interested in psi, knew a lot about how it shows itself in our lives, and wove it into their most important works, showing that psi events not only happen, they are often dramatically and tellingly important. Besides Shakespeare, he takes us through works of Tolstoy, E. M. Forster, G. K. Chesterton, Ingmar Bergman, and James Joyce, showing their very realistic (not cheaply overblown) and sophisticated use of psi pretty much as we know it. Those of us who have lived with what Jule Eisenbud (more in a moment about him) called the "psi hypothesis." It is in his discussion of Joyce's *Ulysses*, a book I personally never managed to finish, that we find a fine-grained weaving of psi connections among the memories, dreams, conversational accidents, and surprising behaviors of the characters. They were not only interacting, as novelists show, more or less consciously, but they were also interacting unconsciously, and in ways that reflected significant knowledge of one another that they had no right to have. Joyce was a parapsychologist, too. The other chapters in this section also will interest appreciators of these geniuses who might be intrigued to see an aspect to their work that they had not imagined. I can think of other writers and film-makers who could be added to this list, now that I think of it, and many others will, too.

The chapters have different voices because the writer was imagining different audiences. My favorite voice is the one he uses when he is writing for people who like to talk about Shakespeare and Tolstoy and Ingmar Bergman. The next most pleasing is when he is speaking to people who are interested in Navajos. Less pleasing is the voice when he talks to psychoanalysts: He becomes very serious and a little convoluted, as they tend to be.

But the beating heart of the book is in the two chapters on psi in psychoanalysis, the conduct of psychoanalysis and the literature of psychoanalysis, and in the exposition of the work of the psychoanalyst Jule Eisenbud.

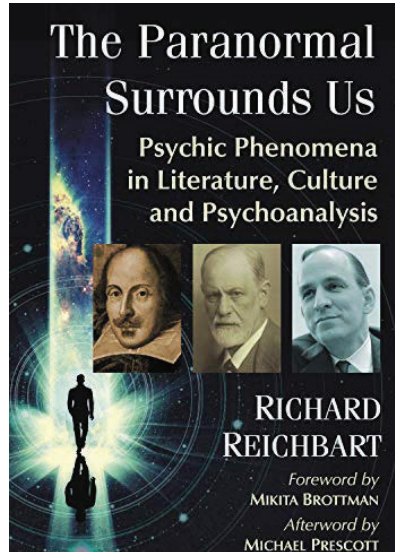
An odd and striking thing he notes about the psychoanalytic

literature is that telepathic experiences keep being brought up and then forgotten and then brought up again by someone else, who often writes as if he or she has made a new discovery. Freud himself, who was considerably preoccupied with the “problem of telepathy” throughout his life, displayed this in microcosm, in one place finding it extremely important, then in another insisting that it doesn’t occur at all, over and over. At one point he declared that if he could live his life over, he would devote his life to psychical research, then later denied ever saying such a thing, until it was proven to him by showing him a copy of his letter. Most of what Freud had to say about the matter we only know from scholars who dug into his essays that were never published and talks that were not presented. Such were his fits-and-starts. Freud and other psychoanalysts have a lot to say about ambivalence and motivated forgetting, when found in their patients. That this occurred so much in Freud’s writing about this topic, and is mirrored in the recurrent amnesia, with moments of interest immediately suffocated by institutional hostility, shown by later writers in the field, obviously begs for psychoanalytical interpretation. Reichbart offers us some thoughts, emphasizing the ideas of Eisenbud and Angelos Tanagras.

An especially nice contribution is Reichbart’s digested summary of the major principles proposed by Freud about the nature of psi (particularly telepathy). These include the assertion that psi experience does not only express severe shock or trauma, but is actually part of everyday (unconscious) life, that sleep facilitates psi expression, that analysts can usefully share the fact of a psi occurrence with the patient, that repressed material of the patient *and of the analyst* are both commonly expressed when telepathy occurs, and that the dynamic of jealousy for the analyst’s interest is a frequent motive driving the phenomena. Most of us grew up with siblings, and we have known a lot about jealousy for our whole lives. What a force it is, is one of the dark but retrospectively rather obvious discoveries made by psychoanalysts who encourage radical honesty about emotional matters in their sessions and who try to be honest in reflecting back to the patient her baser motives. It is such forces, thought Freud, that channel the expression of psi.

Then what drives the ambivalence about psi, the forgetting, the institutional oppression found in Freud and in the whole history of the

field of psychoanalysis? Reichbart thinks that Eisenbud was probably right in his assertion that psi, in the form of psychokinesis, is the critical factor. If psi exists, and mere thoughts can affect the world, then we cannot with certainty hold ourselves blameless when bad things happen that we might have wished for. He thinks that it is this dark, “voo-doo” implication of psi that is the basic stumbling block to accepting its reality, both for psychoanalysts and for the rest of us as well. Just as we repress our hostility, and even our knowledge



of our hostility, we repress the possibility that our hostility might be *really powerful* all by itself! When I first read of this argument of Eisenbud’s, I found it unconvincing. In fact, I dismissed it rather easily, then noticed that I had a little trouble even remembering it clearly later. When I tried to make myself take the possibility more seriously: “*Really, what if ___?*,” I found something like a vague, inchoate cloud of anxiety come up making further thoughts difficult. In other words, I found that I was perilously close to proving him right by my own complete but shifty rejection of the idea. Perhaps I accepted psi so easily because I didn’t *really believe myself* in the reality of psi, all my own work to the contrary. At this point, I would just say that I think that Eisenbud and Tanagras and Charles Tart were on to something real with this hypothesis, even if it might not cover all of the reasons for our cultural hostility to psi.

Reichbart mentions lots of contributions made by other psychoanalytic writers, including recently published brave souls like Janine DePeyer and Ofra Eshel and Ruth Rosenbaum, presenting a fine summary of this field. He also offers a number of clinical incidents from his own experience. The patterns he and others have found largely echo the early reports of Freud and his contemporaries Sandor Ferenczi and Istvan Hollos, and extend them and offer new thoughts

and hypotheses as well. In general, Reichbart makes it clear that psi events do occur in the course of analysis, at least for some analysts; some patients produce a lot of them. They occur in contagious “fields” rather than one-to-one communications, and these events often express important things about hidden emotional dynamics in the transference/countertransference relationship.

But the other psychoanalyst he knows best in this context and says most about is Jule Eisenbud. Reichbart had a long, many-sided relationship with Eisenbud. First, he received analytic treatment from him, which was very helpful at a critical point when he had no interest in psychoanalysis or parapsychology, but did have an emotional crisis to tend to. Then, learning about Eisenbud’s parapsychological interests mainly from reading and from other people, he came to appreciate Eisenbud’s insights and professional courage. As the years went on, they were friends and colleagues.

I have long had great appreciation for Eisenbud as well. He was a prominent analyst in New York, when he tarnished his reputation by his unequivocal exploration of the paranormal, particularly the paranormal photographs produced by an eccentric alcoholic named Ted Serios. Eisenbud also showed how much could be gained by taking the “psi hypothesis” seriously in psychotherapy, and spelled out his findings in books and articles. Just as Freud found the English stuffy (notably Ernest Jones, who kept trying to dissuade him from “the occult”), Eisenbud apparently came to find East Coast orthodoxy stuffy, and moved out west to Denver, where an intellectual climate of possibility is still more prevalent. This is where Reichbart met and first worked with Eisenbud.

Reichbart’s exposition of Eisenbud’s central thoughts is a fine service he provides in this book. I have read Eisenbud’s books, but his prose, while spirited and colorful, is somehow also often clunky and turgid. Reichbart is straightforward and lucid. This book is a good place to learn much of what one might want to know about Eisenbud’s thought and work.

The main weakness of the book is its repetitiveness. This is because several independent essays are presented, which often needed to cover the same ground in their introductions. Some editing would have helped, but I found this a minor annoyance. It does suggest that if Reichbart gave himself over to writing a longer, sustained exposition

of his observations and thoughts it would be fun and enlightening to read. Another annoyance is his clinician's subtle attitude of disdain for experimental work on psi, and his relative ignorance about it. He bridges worlds. It would make his contribution better if he would bridge these worlds, too.

Even so, this is a helpful book. It speaks to different groups of readers. Psychoanalysts, scientific parapsychologists, lovers of literature, fans of the unwashed paranormal, anthropologists, even legal scholars, will be goaded to learn more about each other's landscapes, to everyone's gain.

Such is the ambivalence, and professional fearfulness, of psychoanalysts that many of their more important contributions in this area have only appeared posthumously and, like Freud, dug up by others. Reichbart is slightly and justifiably proud of himself for coming out with this book while he is still alive. Be more daring, he and Eisenbud say to their profession. After all, why are they doctors of the soul? He says,

. . . . no matter how brutal and sad the internal world of our patients may be, what our profession ultimately desires for them is not only emotional stability but that they will be moved by our clinical work with them into creativity and wonder, into the ability to enjoy beauty, love, and admiration for this existence that we share. . . . Rather than defend against (psi events), we should be delighted to explore them as we would do with anything psychoanalytic and to bring to them the full range of our psychoanalytic understanding for our patients and ourselves.

BOOK REVIEW

Gerda Walther's Phenomenology of Sociality, Psychology, and Religion edited by A. Calcagno. Book 2 in *Women in the History of Philosophy and Sciences* series. Springer, 2018. 171 pp. ISBN 978-3319975917.

REVIEWED BY RENAUD EVRARD

<https://doi.org/10.31275/20201821>

Creative Commons License CC-BY-NC

This book is part of a Springer series on *Women in the History of Philosophy and Sciences* that attempts to rebalance the sexism in science and the so-called “Matilda” effect (denial or minimization of the scientific contribution of women researchers to the benefit of their male colleagues). I’m clearly not a specialist in the deep philosophical work discussed by the contributors of this book, and thus will not give a fully technical review, but I was strongly curious to learn more about Gerda Walther (1897–1977). Indeed, she was for me the famous “secretary of the Baron von Schrenck-Notzing” (1862–1929), one of the main psychical researchers of the modern era (Mulacz, 2013; Sommer, 2012; Wolfram, 2006). For my own historical research (Evrard, 2016), I read a lot of correspondence between Walther and members of the Institut Métapsychique International in the archives of that French research group and in the archives of the Institut für Grenzgebiete der Psychologie und Psychohygiene in Freiburg-im-Breisgau. But I didn’t have any clue about the wide dimension of this scientist’s thinking and her importance for the history of philosophy as a brilliant student and continuator of Edmund Husserl’s thinking.

The book provides probably the best overview of her life and philosophy. In the first part, “The life and work of Gerda Walther,” Rodney Parker gives “a sketch of her life” (pp. 3–9); and Marina Pia Pellegrino writes about the general orientation of her phenomenological approach of “traces of lived experiences” (pp. 11–24).

The second part, "Social ontology and the self," goes deeper in the contextualization of her philosophy. Alessandro Salice and Genki Uemura discuss her theory of social acts and communities (pp. 27–46); Anna Maria Pezzella focuses on "Community" and the comparison with Edith Stein's philosophy; Antonio Calcagno explores the "possibility of a non-intentional we of community" (pp. 57–70); Julia Muhl digs into her anthropological approach of human beings as social beings (pp. 71–84); Christina Gschwandtner does the clearing of the German concepts of *Körper*, *Leib*, *Gemeinschaft*, *Seele*, and *Geist* in early phenomenology (pp. 85–99); and Manuela Massa has a chapter on "What is the condition for members of social communities to be 'real' people according to Gerda Walther?" (pp. 101–111).

The third part is clearly the most attractive for readers of this journal because, under its title "Religion and mysticism," it depicts Walther's original phenomenology of mysticism and paranormal experiences. Rodney Parker introduces what Walther considered her main philosophical work, *Zur Phänomenologie der Mystik* (1923). Angela Ales Bello analyses "the sense of mystical experience" (pp. 135–147) and Kimberly Baltzer-Jaray the "phenomenological approaches to the uncanny and the divine," through the influence of Adolf Reinach on Walther (pp. 149–167).

This is how I understand what happened: During the winter of 1918, Walther had a strong mystical experience, which is described at the end of the book (pp. 153–154). Her experience has two distinct elements: a moment of foreseeing into the future, and then feeling the presence of something Divine. She recalled having been in a strange state in her parent's home, before taking the train: She had episodes of weakness sweep over her to the point of losing control of her body and most likely her consciousness, too, and she tells of a growing distance from and disinterest in her life and all she cared about.

Suddenly, I knew with uncanny clarity: "When I arrive in Freiburg, I will either be dead or mentally ill or I will have found something entirely new, unknown, which gives a different meaning to my entire life." (quoted on p. 153)

In the second part of her experience, she felt a new source of energy:

“a sea of warm love and kindness surrounded me. It stayed with me a long time” (quoted on p. 154). Later, she arrived at the conclusion that this was a mystical experience, something absolutely remarkable, given that she was raised as an atheist, and this atheism leads her to give up her political ambitions in the Social Democratic Party and pursue an academic career. “It also opened her eyes to all the experiences possible for humans, ultimately resulting in her interest not only in mystical experiences but also parapsychology,” (Baltzer-Jaray on p. 154).

She found in the phenomenology of her time the appropriate tool to develop this approach. Indeed, even if neither Husserl nor his colleagues “were attracted to the study of the paranormal and the occult, [they] all maintained that no phenomena were to be excluded from phenomenological study” (Bello on p. 139). In addition to this openness, the second quality of phenomenology is its non-reductionism. As Henry Corbin (1958) highlighted in his review of the second edition of her masterpiece, this book fulfills its promise to analyze the mystical phenomenon for itself, with no other presupposition than to let it show itself as it is and to accept what it shows.

It is therefore not a question of abstract constructions, of views of the mind, of fantasies, of memories, or of ‘thinking of’, but of *Erlebnisse*, lived-states of a real presence, in which the ‘phenomenon of God’ presents itself in the state of data.
(Corbin, 1958, p. 94; my translation)

Mystical phenomenology consists in studying all the lived phenomena (*Erlebnisse*), which, according to their intrinsic meaning, claim to make God a real datum, however imperfect it may be. Comparing her to Edith Stein, Bello (p. 135) wrote that “Walther can be rightfully viewed as the phenomenologist who carried out the most sustained and focused research on the phenomenon of mysticism (. . .) making illustrative references to mystics from a variety of religions.”

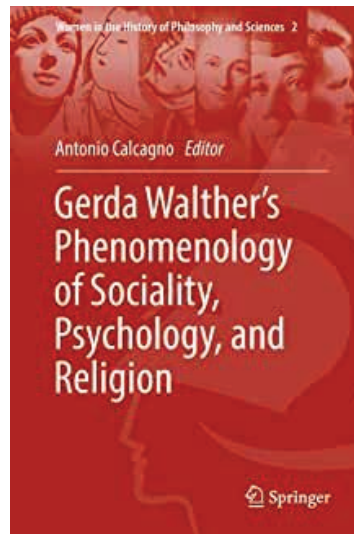
One of the main influences on her research was Adolf Reinach, to whom she showed fidelity: “Above all, to leave religious phenomena their intrinsic meaning, even if they pose enigmas. Because it is precisely these puzzles that can have the greatest value for the knowledge of the truth” (Walther, 1923). This may sound like a scientific value in

anomalistics: to avoid the pretension of resolving the *quaestio juris* before the *quaestio facti*, that is to say to decide a priori the possibility of a fact before having studied it.

Indeed, a quick look into Reinach's initial work leads us into parapsychology, with a study that may be compared to Charles Richet's work on soldiers' various parapsychological experiences (De Vesme, 1919). During WWI, in 1916 while fighting at the Belgian front, Reinach overheard conversation at his camp of soldiers foreseeing their own deaths. The staff sergeant there thought these experiences were pure superstition, the result of exhaustion, and furthermore death in war is a very likely occurrence that can be somewhat predictable. In listening to this conversation, Reinach realizes that the only way to overcome the skepticism of someone like the staff sergeant is "to provide evidence for these experiences and proof that knowledge is obtainable from them" (Baltzer-Jaray on p. 155). It seems that Walther follows the same guidelines, starting from her own experiences like others after her (for instance, Evrard, 2013).

Walther discriminates against the mystical experience leading to the meeting of a personal God and that which immerses the Spiritual in an abyss of light, love, power, where "there is no one." But most interestingly, she treated "parapsychological" experiences with the same tools she used with religious and mystical experiences. She is clearly a pioneer of this approach to let the experiences speak for themselves. This collective book is really struggling to clarify anything that could be extracted from her analysis of these specific experiences. It focuses in an unbalanced way on the social objects studied by Walther to the detriment of the mystical and parapsychological phenomenology to which her attention was particularly pointed (again, coupling literature cases with her own experiences).

However, Corbin (1958, p. 96) claims one of the most original



analyses in the book, her study of the telepathic connection between human beings (Chapter IV of the 1955 edition of her *The Phenomenology of Mysticism*) and internal communication with the deceased (Chapter V). The experience of a “stranger subject,” someone else’s soul in my own interiority, reveals to us a crucial dimension of human subjective construction: its connectivity. Corbin (1958, p. 96) saw “an interesting indication in the author’s affinity for the telepathic link and the *unio mystica*, the deep inner unity between the ‘sender’ and the ‘receiver,’ the feeling of a bi-unit (*Zwei-Einheit*).” Indeed, Walther found in telepathy a kind of fundamental phenomena that allows a better understanding of the construction of human psychism. Humans seem to be not fully individual, but can connect with a collective noetic dimension that is the basis of mystical experiences.

This scholarly book is quite symptomatic of the neglect of parapsychology in philosophical circles. Here we have a philosopher whose mystical and paranormal experiences are the starting block of her thought, but her commentators still find a way to make distinctions and disconnect orthodox subjects from heterodox ones. In fact, while more than half of the book is on “social ontology and the self,” the authors clearly failed to show how this is related to parapsychological topics discussed elsewhere. A community, for Walther, is understood as a unity or oneness, a *Vereinigung*. Communities have both subjective and objective sides. Walther also identifies the possibility of we-communities that are non-intentional and have no classical intentional object. Love is an example she focuses on. A way to connect these points is to argue that Walther’s example of the telepathic link as a transcendent connection between human beings is behind her theory of (spontaneous) social communities. Similar ideas may be found in French philosopher Jean Jaurès’ “universal solidarity of living beings” (1892) or later in Gabriel Marcel’s defense of “communion” as a philosophical concept that should be applied to extra-sensory perception (Boussé, 2013).

Even if this book allows us to have a look into usually inaccessible German texts and Walther’s correspondence and personal papers, it still fails to integrate them into a whole picture of her work. There’s no exploration of Walther’s parapsychological correspondence and work, particularly her collaboration with Schrenck-Notzing (Walther, 1962).

This missing chapter is probably the missing link to understanding how her philosophy of personal experiences teaches us something about the general human condition.

REFERENCES

- Boussès, J. (2013). *Gabriel Marcel: Une métaphysique de la communion*. L'Harmattan.
- Corbin, H. (1958, January–March). Phenomenology der mystik. *Compte-rendu. Revue de l'Histoire des Religions*, 153(1), 92–101.
- De Vesme, C. (1919). L'enquête du Prof. Ch. Richet sur les faits métapsychiques aux armées. *Annales des Sciences Psychiques*, 2(3), 17–24.
- Evrard, R. (2013). Portrait of Rhea White: From parapsychological phenomena to exceptional experiences. *Journal of Exceptional Experiences and Psychology*, 1(1), 37–40.
- Evrard, R. (2016). *Enquête sur 150 ans de parapsychologie. La légende de l'esprit*. Trajectoire.
- Jaurès, J. (1892). *De la réalité du monde sensible*. Rieder.
- Mulacz, P. (2013). Schrenck-Notzing Doppel-Rezension Dierks, "Thomas Mann's Geisterbaron" und Kuff, "Okkultesthetik". *Zeitschrift für Anomalistik*, 13(1+2), 221–233. https://www.academia.edu/38320829/v_Schrenck_Notzing_Doppel_Rezension_Dierks_Thomas_Manns_Geisterbaron_und_Kuff
- Sommer, A. (2012, April). Policing epistemic deviance: Albert von Schrenck-Notzing and Albert Moll. *Medical History*, 56(2), 255–276. <https://doi.org/10.1017/mdh.2011.36>
- Walther, G. (1923). *Zur phänomenologie der mystik*. M. Niemeyer.
- Walther, G. (1962). Dr med. Albert Freiherr von Schrenck-Notzing: Leben und werk [Dr Albert von Schrenck-Notzing, MD: Life and work]. In G. Walther (Ed.), *Grundfragen der parapsychologie* [Foundations of parapsychology] (pp. 11–31). Kohlhammer.
- Wolffram, H. (2006). Parapsychology on the couch: The psychology of occult belief in Germany, c. 1870–1939. *Journal of History of Behavioural Sciences*, 42(3), 237–260. <https://doi.org/10.1002/jhbs.20171>

BOOK REVIEW

Charles Richet: A Nobel Prize Winning Scientist's Exploration of Psychic Phenomena by Carlos S. Alvarado. White Crow Books, 2019. 212 pp. ISBN 978-1-78677-111-7.

REVIEWED BY RENAUD EVRARD

Laboratory Interpsy, University of Lorraine, Nancy, France

<https://doi.org/10.31275/20201823>

Creative Commons License CC-BY-NC

Carlos S. Alvarado is a well-known specialist of the history of parapsychology, and also famous for his pedagogical skills mostly as an affiliate of the Parapsychology Foundation and the Alvarado and Zingrone Institute for Research and Education. Most of the material used in this book was already available online on his blog (<https://carlossalvarado.wordpress.com>), as it is a collection of previously published essays. I am one of the people who publicly endorsed the book because Alvarado is clearly one of the most qualified authors able to deal with this topic, but here I will provide complementary expertise based on my reading of the book and my own work on the history of French parapsychology (Evrard, 2016). (I also contributed to Appendix E, “Bibliography about and by Charles Richet with emphasis on psychic phenomena,” pp. 119–132.)

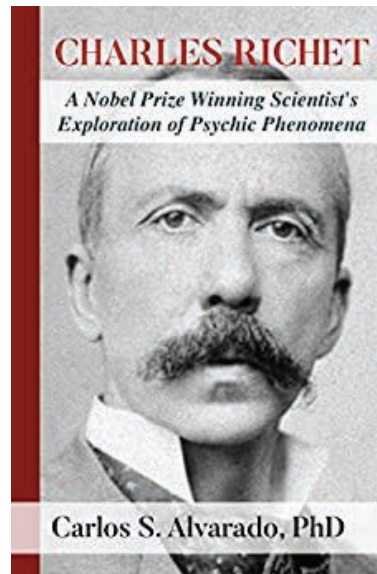
Charles Richet (1850–1935) was a French physiologist (Nobel laureate 1913) who contributed to many fields, among them psychology and psychical research. The book gathers six essays and tries to exhaustively cover these specific contributions through various lenses: a general overview of his interest in psychic phenomena (Chapter 1, pp. 1–26), a discussion of his metapsychic autobiography (Chapter 2, pp. 27–44), an analysis of his early ideas on mental suggestion and his pioneering use of probabilities in human sciences (Chapter 3, pp. 45–54), his various attempts to create gateways between psychology and

psychical research (Chapter 4, pp. 55–66), a review of his masterpiece *Traité de Métapsychique* (Chapter 5, pp. 67–84), and a final comment about his own conclusions regarding what he learned from psychical research and the survivalist hypothesis (Chapter 6, pp. 85–96). The first four appendices cover small historical points such as Richet's sessions with famous medium Leonora Piper (pp. 97–102), one on his observations of moving ectoplasm (pp. 103–104), a note about the term “ectoplasm” (which he didn't coin) (pp. 105–106), and an extract from his *Traité* (pp. 107–118) about the scientific stature of “metapsychics,”

his own term for parapsychology, in which we see an illustration of his clever and Hugolian style of expression.

This format (collection of essays) is quite frustrating as the transformation into a book keeps the original writing style, with separated focus points and no clear transitions or ending. We don't have a general contextualized view that historians or lay readers usually expect, but this is an exhaustive approach that covers all the material relative to Richet. The book is therefore a must-have for every researcher who would like a clear view of this complex person. It deserves the moniker of researcher handbook thanks to Appendix E (“Bibliography about and by Charles Richet with emphasis on psychic phenomena,” pp. 119–132) and Appendix F (“Bibliography about the history of psychical research and related areas,” pp. 133–142), the References section (pp. 145–173), the Notes (pp. 175–187) associated with each chapter, and the final Index (pp. 189–198). All in all, half of the book is made up of scholarly tools for this specialized topic.

Alvarado has created a truly historical work and he has extensive knowledge of all the primary sources written in various languages. Except for some very small mistakes and missing facts (such as the dates of birth and death of the medium Marthe Baude, p. 6), the material



is relevant and fact-checked. Readers may enjoy these “encyclopaedic” articles such as Chapter 1, which is a very accessible treasure of concision. Others may regret that this or that point is only mentioned, diluting its epistemological significance, without transitions among the different bullet points. For instance, regarding the scandal around the Villa Carmen experiments in Algiers (1905), Alvarado allocated one paragraph in the main text and one endnote, and referred to several relevant reviews. We could find that rather short compared with the impact that this scandal had on Richet’s scientific reputation. But this book is all about offering an overview.

The analysis of Richet’s metapsychical autobiography (Chapter 2, pp. 27–44) is an analysis exercise on how such oriented texts distort the truth and how historians should handle them. As concluded by Alvarado, this chapter of Richet’s autobiography is less detailed than the others, and produces an account with important omissions and errors (p. 40).

It seems very difficult to give a true picture of a man with so many facets and who was so neglected, therefore Alvarado tried to pull threads so as not to get lost. Thus, the analysis of his important article of 1884 on mental suggestion and statistics (Chapter 3, pp. 45–54) is an opportunity to question the scientific and methodological context of the time. However, the chapter is more like a critical edition with a step-by-step commentary on Richet’s article which Alvarado is committed to presenting to the public. This sometimes gives a somewhat laborious reading where pedagogy takes precedence over historical analysis, that is to say where it is difficult to perceive the author’s own ideas.

When I turned a page and found myself at the beginning of the Appendices while still at the middle of the book, my frustration was great. How to conclude? Can we do it? I would like to read more. We must congratulate Alvarado for having laid these few bricks and hope that others will quickly seize them to build the rest of the building.

REFERENCE

Evrard, R. (2016). *Enquête sur 150 ans de parapsychologie. La légende de l'esprit*. Trajectoire.

BOOK REVIEW

The Source and Significance of Coincidences: A Hard Look at the Astonishing Evidence by Sharon Hewitt Rawlette. Self-published, 2019. 632 pp. \$42.41 (paperback). ISBN 978-1733995702.

REVIEWED BY LANCE STORM

School of Psychology, University of Adelaide
lance.storm@adelaide.edu.au

<https://doi.org/10.31275/20201837>

Creative Commons License CC-BY-NC

Sharon Rawlette's offering to those appreciative (even enamored) of the fickle, unpredictable, and mystifying world of coincidences, is a mammoth tome of 600+ pages ambitiously bearing the title *The Source and Significance of Coincidences*. As the title suggests, Rawlette seeks to explain who or what might cause coincidences (these explanations are far-ranging), and she endeavors to point out what they mean (usually they have only a positive spin). Right from the outset, Rawlette gives the term coincidence its own special definition, but anyone steeped in the Jungian tradition cannot help but see that Rawlette's brand of coincidence runs parallel with Jung's (1952/1969) *meaningful coincidence*, better known as synchronicity. The many examples she gives fit the bill, and they don't require an overly flexible turn of mind to see it, but Rawlette insists on distinguishing her type of coincidences from paranormal experiences ('telepathic messages'), after-death (discarnate) communications, and even Jung's synchronicity. It is unfortunate that her definitions do not shore up the distinction she wishes to make: Coincidences are "physical events that appear to reflect the contents of people's minds," and they convey "personal meaning" (p. 11) but that's synchronicity! Rawlette also includes as coincidences those events "without any obviously profound meaning and yet seem too improbable to be the mere products of chance" (p. 11). That could still be synchronicity — one couldn't spot a coincidence if it didn't have

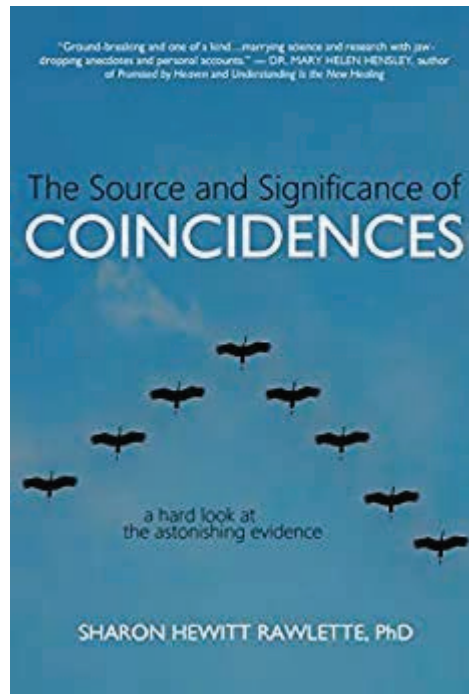
some meaning (Flew, 1953), which may not dawn on someone as being profound until some time has passed.

It's not clear which of the two issues, meaning or chance, Rawlette sees as pivotal, or is more important to her, or is the bigger problem. We could assume they jostle with each other for pride of place in the interpretation stakes—sometimes chance supersedes; sometimes it's meaning; sometimes it's a tie. Not necessarily a fault of *Coincidences*, and Rawlette does an honorable job of reconciling the two, but I see her book as tacitly showing us how both concepts or constructs are impossible to nail down, so that very little is sorted out despite her in-depth considerations, analyses, and interpretations (this conclusion will become more apparent later).

But Rawlette makes bigger claims for coincidences: Not only can entities existing in metaphysical or transcendental space causally account for the various coincidences, but the human mind is able to provide its own internal, independent, causal mechanism (generally called psi) in the form of telepathy, clairvoyance, precognition, and psychokinesis (whole chapters are devoted to these topics). I don't make a distinction—for me, psi *is* one kind of coincidence (synchronicity actually; see Storm, 2008), whereas Rawlette is saying the situation that emerges from psi is the coincidence. I acknowledge there's a semantic 'fine line' here that blurs the boundaries, and has thus contributed to making anomalies of psi, coincidence, and synchronicity; the trouble being that for millennia, we have struggled with all three—dismissed them, depended on them, and even proved them, experientially and experimentally. What is lacking, however, is a consensus (perhaps one that is theory-driven), and *Coincidences* may be seen as one means by which Rawlette takes on the unenviable task of trying to help society and its various communities reach that consensus. Indeed, *Coincidences* may have some influence in that respect given its scope and scale—the book could work as an introductory primer that relentlessly covers every possible aspect of its topic in order to demonstrate the ubiquity of coincidence phenomena, and therefore its importance.

It remains to be seen whether Rawlette's aims of specifying source (Part One of her book) and significance (Part Two) go against her or not, but there's a worldview driving those aims, and it's not a new one (ironically, the term New Age suggests itself, but I don't say the book

fits that category entirely). I just mentioned how a consensua common understanding is needed in our modern/postmodern but fragmented world. While I won't go into the sociological, psychological, scientific, and even scientistic reasons for our failure to reach a consensus on the various anomalies, these reasons come to mind when, as already hinted at, Rawlette brings in God, angels, guides, and so on, as one set of causes (sources) of coincidences (the other cause being psi, as I also mentioned earlier). We know



how much the proposition of such entities grates with the skeptical communities, and although one does not always sympathize with their aims, let alone tolerate their practices and opinions, the issues they have are not unfounded, and need addressing.

To cut to the chase, it is not helpful to explain one mystery in terms of a number of other mysteries, and while skeptics are good at spotting the many worldviews driven by that 'dogic', and believers not so much, many of both persuasions ought to be a little more open to the pursuit of a solid scientific foundation to their beliefs or disbeliefs. Otherwise, they're just nestling in dogma. To come closer to knowing than just believing (or disbelieving), one has to challenge taken-for-granted assumptions by asking the right questions. In that sense, the text is not without its problems — for example, it is implied that ghosts ("the dead") can appear to whomsoever they like (they are selective; see p. 175). But by what power does an entity have the capacity to be selective? How does it screen itself off from others? What special physics or metaphysics explains it? Why should being psychic have anything

to do with it? What does psychic even mean? So much is assumed in *Coincidences*, and it may be nigh impossible to answer these questions, but that's no excuse not to try, or ask.

To continue with one other aspect of the psyche/mind issue, we then encounter another fly in the ointment: mental illness. It can cause coincidences, but Rawlette reminds us that only a sound mind with normal reality-testing skills has a fighting chance at interpreting coincidences constructively. As historian Richard Tarnas (2007) noted:

The recognition of synchronicities requires subtle judgments made in circumstances usually pervaded by ambiguity and open to multiple interpretations. . . . Synchronicities seem to constitute a lived reality the experience of which depends deeply on the sensitive perception of context and nuance. For synchronicities have a shadow side as in the exaggeration of the trivial to discover a self-inflating meaning. (Tarnas, 2007, p. 55)

It is quite true that egotism, dissociation, delusion, and other mental aberrations distort reality, but it seems to me that there are no solid reasons why mental illness (even severe forms) could not play a legitimate role in coincidence formation that serves the afflicted person's ultimate good, and can be interpreted as such. It seems the examples Rawlette gives make it very clear that these kinds of 'imbalances' never have benefit (see pp. 249–250, 302). Of course, inflated egos and sick minds might see coincidences where none *seem* to exist, but who's to say we haven't sufficiently plumbed the depths of coincidence phenomenology to know for sure where and when we may meet with elaborate tricksterish nonsense. Likewise, the balancing concept of yin/yang, that we've adopted from the East (for good reason), teaches us that there's going to be some devilry in *every* coincidence; so I don't mean we should only be watchful of obvious possession cases involving 'all-meaning entities.'

And then there is Rawlette's treatment of the chance factor, which actually comes in very early in the book—the first chapter in fact. While Rawlette devotes a good two dozen pages to the topic of 'chance', that is not as substantial as the space spent on other topics (metaphysical

entities being a major player). It seems to me, chance is *the* pivotal issue that underpins the whole coincidence dichotomy (a bigger issue than meaning), and it is thereby the main tool of the Trickster,¹ getting us into all sorts of scrapes. And even though Rawlette acknowledges the presence of chance forces behind many coincidences, there is the assumption that coincidences come from a special place only if chance is ruled out of the picture. For Rawlette, chance acts like an 'entity' of sorts that does not allow one to comfortably embrace coincidences as not only *meaningful*, but also as ontologically *real* and *genuine*. But is it not possible that even a chance occurrence holds a meaning that can be of use to us? Tarnas's advice would still hold – just substitute the word 'synchronicities' with the term 'chance events' in the quote above. *Coincidences* (the book) seems to make an enemy of chance, when the casual (everyday) usage of the term is in itself a stifling impediment to our understanding. Indeed, as Jung (1952/1969) has said

Chance, we say, must obviously be susceptible of some causal explanation and is only called "chance" or "coincidence" because its causality has not yet been discovered. (Jung, 1952/1969, paragraph 823)

Physicist and Jungian scholar Victor Mansfield (1995) agreed: "Implicit in the usual use of the word *chance* is a deep commitment to causality" (p. 80). They seem to be saying an event that happens by chance is not random, since anything that is *caused* automatically cannot be random! Perhaps we need to be very careful how we use these words.

Very wisely, Rawlette covers the problem of chance by discussing the Law of Very Large Numbers (a.k.a. Law of Truly Large Numbers) which tries to deal with chance in its own limited way. She explains its importance, but she is also in agreement with Bernard Beitman, who notes that the law "can only be properly applied when we have data for those large numbers" (Beitman, 2020, p. 47). However, and to go further, I see the Law as seriously getting in the way of understanding Rawlette-type coincidences, and more specifically, synchronicity. I say this because I regard the Law as overly explanatory, to the degree that every kind of age-old or newly discovered phenomenon can be caught

in its net, even scientific findings. Most scientists (partly speaking on behalf of their inner statistician) will tell you that there are checks and balances that help censor inappropriate appeals to the Law, but the point is, if you're going to make a ruling on what usage is *appropriate* or *inappropriate*, you have to make a subjective value judgment (especially if you don't have a good theory and/or you can't replicate the coincidence). A judgment cannot be unbiased if it results in a Law being applied merely as a means of dealing with inconveniences like psi and coincidences.

My opinion on these matters, after 20 years of postdoctoral research, is that we *can* make an epistemological claim for psi and synchronicity (from this point on, I shudder to use the single term coincidence without qualifying it as either meaningful or meaningless), but we only inch toward a viable theory that might underpin them; especially one that is generally acceptable. I'm certain the problem stems from having no solid ontological ground from which to work. I believe any kind of monism misses (or even *dismisses* in some cases) one whole side of reality if it does not recognize more than one aspect to existence. I feel it may be that breakthroughs in our understanding and conceptualization of reality can be made only once we take a more holistic viewpoint. Fortunately, parapsychologists and physicists are becoming aware of the possible gains entailed in this outlook.

In closing, Rawlette's *Coincidences* is a substantial piece of work, and there is little to fault it (unless, of course, one goes into the deeper philosophical issues). So much ground is covered, it is truly a useful resource. As a researcher interested in synchronicity for many years, I was pleasantly surprised when the book arrived in my letterbox, and I looked forward to reading *Coincidences*. Indeed, the gains have been palpable. Newcomers to the field of coincidences (meaningful and meaningless), synchronicity, and the search for meaning, will not be disappointed, and they should not be dismayed by my critique. As I have implied if not outrightly stated, the key issues covered in *Coincidences* deserve our greatest consideration and attention. The book is well-presented, and typo-free, printed on good-quality paper, and well worth its moderate price.

NOTE

¹ The Trickster emerges as an archetypal figure in mythology and as a societal (behavioral) mechanism in most cultures worldwide. Hansen (2001) describes it as a personification of a “collection of abstract properties that tend to occur together,” such as “disruption, deception, . . . , psi phenomena, and marginality” (p. 427).

REFERENCES

- Beitman, B. D. (2020, January). Review of the book *The source and significance of coincidences: A hard look at the astonishing evidence* by Sharon Hewitt Rawlette. *Journal of the Society for Psychological Research*, 84(1), 46–48.
- Flew, A. (1953). Coincidence and synchronicity. *Journal of the Society for Psychological Research*, 37, 198–201.
- Hansen, G. P. (2001). *The trickster and the paranormal*. Xlibris Corporation.
- Jung, C. G. (1969). Synchronicity: An acausal connecting principle. In *Collected Works of C. G. Jung, Volume 8* (pp. 417–519). Bollingen Series XX. [Original work published in 1952]
- Mansfield, V. (1995). *Synchronicity, science, and soul-making: Understanding Jungian synchronicity through physics, Buddhism, and philosophy*. Open Court.
- Storm, L. (2008). Synchronicity and psi. In L. Storm (Ed.), *Synchronicity: Multiple perspectives on meaningful coincidence* (pp. 273–296). Pari Publishing.
- Tarnas, R. (2007). *Cosmos and psyche: Intimations of a new world view*. Plume.

FURTHER BOOK OF NOTE

The Last Farewell Embrace: Spirituality, Near-Death Experiences, and Other Extraordinary Events among Nurses by Alejandro Parra. Nova Science Publishers, 2019. 155 pp. \$95.00 (paperback). ISBN 978-153-6153-43-9.

REVIEWED BY JIM B. TUCKER

<https://doi.org/10.31275/20201805>

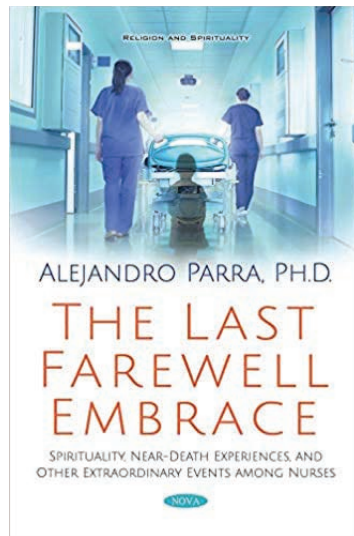
Creative Commons License CC-BY-NC

Alejandro Parra, a psychologist who teaches at the Universidad Abierta Interamericana, is the author of several books, including one on the history of parapsychology in Argentina. In his latest, he writes about his interviews with dozens of nurses and professional caregivers regarding exceptional experiences that they either witnessed in patients, often at the end of life, or had themselves. As an example, a psychiatric nurse in Buenos Aires told about a patient who woke up at four o'clock one morning, shouting "My house is on fire, my house is on fire!" The distraught woman tried to leave the hospital and eventually had to be sedated with medication. Two days later, relatives arrived with objects that had been rescued from a fire at her house, which had occurred at four in the morning.

The book includes no systematic analysis of the reports, and such gems are unfortunately sprinkled only sporadically through a narrative that is too often unfocused. Dr. Parra has done his homework and includes references in 334 endnotes. He sometimes cites studies without an adequate explanation of their findings, however, and the material doesn't really add up to a coherent whole. The book frequently moves back and forth between different kinds of phenomena and between a focus on nurses' experiences versus ones that patients have. For instance, it says that "one of the problems associated with . . . near-death experiences is that there are no studies of nurses about possible

related psychological variables” (p. 90) and then explores at length the question of whether the stress of the job, along with abnormal psychological functioning, may lead nurses to have anomalous experiences. But what does the psychology of nurses have to do with the NDEs and other end-of-life phenomena that many patients and their families experience?

All this being said, Dr. Parra displays obvious compassion for both dying patients and their caretakers, and some of the nurses’ reports are undeniably intriguing.





39th Annual SSE Conference

Combined Conference with the Parapsychological Association

hosted by the Rhine Research Center

June 2021

Tentatively June 9–12

**Hilton Durham Hotel,
Durham, North Carolina**

near Duke University



2021 VISION: LOOKING FORWARD
Experience, Experiments, Beyond

For detailed information, as it comes in:

<https://societyforscientificexploration.org/conferences/2021>



WATCH THE ADDRESS ON YOUTUBE

https://www.youtube.com/watch?v=j2FwcDPV02Q&feature=youtu.be&utm_source=Society+for+Scientific+Exploration&utm_campaign=851153eco2-EMAIL_CAMPAIGN_2020_08_21_04_50_COPY_01&utm_medium=email&utm_term=o_857696ca87-851153eco2-2366021

SSE ASPIRING EXPLORERS PROGRAM

The SSE has established Aspiring Explorers Awards for meritorious student research projects judged to be the most original and well-executed submissions in subject areas of interest to the SSE. A committee is in place to review all entries and determine the winners, who will receive awards of \$500 each. One award winner will have the opportunity to present a talk describing the project at the SSE Annual Meeting, for which the Society will cover his/her registration fee. The other award winner will have the opportunity to present a talk describing their project at the SSE Euro Meeting, for which the Society will cover her/his registration fee. Submissions must be made per the guidelines and deadline as stated on the SSE website “Call for Papers” for the conference you are considering attending in order to be eligible for that year’s prize for that conference.

If your paper is selected for the Aspiring Explorer Award, you will be either invited to present your talk at the meeting or able to submit your paper as a poster session. We are very excited about the recent poster sessions at annual SSE meeting, so please let your fellow student colleagues and professors know about this. <https://societyforscientificexploration.org/conferences/2020>

In addition, the SSE is also offering a 50% discount on future meeting registrations for any student member who brings one student friend to our conferences (one discount per student). We are eager to see student clubs or SSE discussion groups established at various academic institutions or in local communities. Contact us at education@scientificexploration.org to start your own group!

C. M. Chantal Toporow, Ph.D., SSE Education Officer
education@scientificexploration.org



Funding for Scientific Research 2020/2021

With the aim of encouraging the research into healthy human being's physical and mental processes, namely in fields still largely unexplored but which warrant further scientific analysis, BIAL Foundation opens now a Grants programme for Scientific Research with the following characteristics:

1. Scope and purpose - Only the fields of Psychophysiology and Parapsychology shall be covered by this programme. The goals to be met by the applicants shall be set out by the Research Project under application.

2. Addressees - All scientific researchers will be admitted as applicants, either individually or in groups, except those working for BIAL Foundation or for any of the companies belonging to BIAL Group. The current Grant Holders of BIAL Foundation can also be admitted as applicants; however, they shall only benefit from new grants under this programme after the successful completion of the work comprised in the scope of previous awarded grants.

3. Duration and commencement - The total duration of the grants shall not exceed 3 years and shall commence between 1st of January and 31st of October 2021.

4. Total amount and payment's periodicity - The approved applications shall benefit from grants in total amounts comprised between €5,000 and €50,000. The specific amount shall be fixed at BIAL Foundation's sole discretion in accordance with the needs of the Research Project under application.

The amount awarded to each Research Project shall be understood as a maximum amount, which shall be paid by BIAL Foundation upon verification of the documents of expenses submitted.

À Av. da Siderurgia Nacional
4745-457 Coronado (S. Romão e S. Mamede) • Portugal
Tel. + 351 22 986 6100 • Fax + 351 22 986 6199
www.fundacaobial.com • fundacao@bial.com



Fields: Psychophysiology and Parapsychology.
Scientific researchers: Individuals or groups.
Duration: Maximum 3 years; commencement between 1st of January and 31st of October 2021.
Total amount: Between €5,000 and €50,000.
Projects from Clinical or Experimental Models of Human Disease and Therapy are not accepted.

The payments shall be made annually or bi-annually. This periodicity shall be defined in accordance with the schedule of the Research Project.

5. Applications - Applications should be submitted in English no later than 31st of August 2020, in accordance with the Regulation of Grants for Scientific Research of BIAL Foundation, via specific online application form available at www.fundacaobial.com. Applications of projects from Clinical or Experimental Models of Human Disease and Therapy shall not be accepted.

6. Assessment of applications and disclosure of results - Applications shall be assessed by the Scientific Board of BIAL Foundation. The decision shall be disclosed, by notice to the applicants, within 4 (four) months from the final deadline for submission of applications mentioned in the preceding section 5.

7. Applicable Regulation - The submission of an application implies the full acceptance by the applicant of the terms and conditions set out in this announcement and in the Regulation of Grants for Scientific Research of BIAL Foundation, which governs the present programme.

BIAL Foundation reserves the right to refuse the application of former Grant Holders who have repeatedly violated their legal and contractual obligations with BIAL Foundation.

The Regulation of Grants for Scientific Research of the BIAL Foundation is available at:

13th SYMPOSIUM OF BIAL FOUNDATION
BEHIND AND BEYOND THE BRAIN
Aquem e Além do Cérebro
The mystery of time
Casa do Médico - Porto
April 1 to 4, 2020
PROGRAM

Registration: <https://workflowapps.bial.com/published/13-symposium-bial.aspx>

Society for Scientific Exploration

Executive Committee

Dr. Bill Bengston
SSE President
St. Joseph's College
Patchogue, New York

Professor Garret Moddel
SSE Vice-President
Dept. of Electrical & Computer
Engineering
University of Colorado Boulder, Colorado

Dr. York Dobyns
SSE Treasurer
Lexington, Kentucky

Dr. Mark Urban-Lurain
SSE Secretary
CREATE for STEM Institute
620 Farm Lane, 115 Erickson Hall
Michigan State University
East Lansing, Michigan 48824
scientificexplorationsecretary@gmail.
com

Dr. Chantal Toporow
SSE Education Officer
Northrup Grumman
Redondo Beach, California

Council

Dr. Margaret Moga
Indiana University School of Medicine
Terre Haute, Indiana

Dr. Roger Nelson
Global Consciousness Project
Princeton, New Jersey

Marco Bischof
Berlin, Germany

John Valentino
Psyeron
San Francisco, California

Harald Walach
Europa-Universitt Viadrina
Institut f r transkulturelle
Gesundheitswissenschaften
Postfach 1786
15207 Frankfurt (Oder), Germany

Appointed Officers

Professor Anders Rydberg
SSE European Representative
Uppsala University
Uppsala, Sweden

Carl Medwedeff
SSE Associate Members' Representative
Livonia, Michigan

Professor Peter A. Sturrock
SSE President Emeritus and Founder
Stanford University
Stanford, California

Professor Charles Tolbert
SSE President Emeritus
University of Virginia
Charlottesville, Virginia

Dr. John Reed
SSE Treasurer Emeritus
World Institute for Scientific Exploration
Baltimore, Maryland

Professor Lawrence Fredrick
SSE Secretary Emeritus
University of Virginia
Charlottesville, Virginia

Professor Henry Bauer, JSE Editor Emeritus
Dean Emeritus, Virginia Tech
Blacksburg, Virginia

Index of Previous Articles in the Journal of Scientific Exploration

Vol: No.	Article	Author(s)
1:1	A Brief History of the Society for Scientific Exploration	P. Sturrock
	Alterations in Recollection of Unusual and Unexpected Events	D. Hall et al.
	Toward a Quantitative Theory of Intellectual Discovery (Esp. in Phys.)	R. Fowler
	Engineering Anomalies Research	R. Jahn et al.
	Common Knowledge about the Loch Ness Monster	H. Bauer
	An Analysis of the Condon Report on the Colorado UFO Project	P. Sturrock
1:2	The Strange Properties of Psychokinesis	H. Schmidt
	What Do We Mean by Scientific?	H. Bauer
	Analysis of a UFO Photograph	R. Haines
	Periodically Flashing Lights Filmed off the Coast of New Zealand	B. Maccabee
2:1	Commonalities in Arguments over Anomalies	H. Bauer
	Remote Viewing and Computer Communications An Experiment	J. Vallee
	Is There a Mars Effect?	M. Gauquelin
	Raising the Hurdle for the Athletes Mars Effect	S. Ertel
2:2	UFOs and NASA	R. Henry
	The Nature of Time	Y. Terzian
	Operator Related Anomalies in a Random Mechanical Cascade	B. Dunne et al.
	Evidence for a Short Period Internal Clock in Humans	T. Slanger
	Three New Cases of Reincarnation Types in Sri Lanka with Written Records	I. Stevenson et al.
3:1	Arguments Over Anomalies: H. ?Polemics	H. Bauer
	Anomalies: Analysis and Aesthetics	R. Jahn
	Trends in the Study of Out of Body Experiences	C. Alvarado
	A Methodology for the Objective Study of Transpersonal Imagery	W. Braud/ M. Schlitz
	The Influence of Intention on Random and Pseudorandom Events	D. Radin/J. Utts
	Case of Possession Type in India with Evidence of Paranormal Knowledge	I. Stevenson et al.
3:2	New Ideas in Science	T. Gold
	Photo Analysis of an Aerial Disc Over Costa Rica	R. Haines/J. Vallee
	Three Cases of Children in Northern India Who Remember a Previous Life	A. Mills
	Signatures in Anomalous Human-Machine Interaction Data	D. Radin
	A Case of Severe Birth Defects Possibly Due to Cursing	I. Stevenson
4:1	Biochemical Traumatology/Plant Metabolic Disorders in a UFO Landing	M. Bounias
	Return to Trans en Provence	J. Vallee
	Analysis of Anomalous Physical Traces: 1981 TransenP rovence UFO Case	J. Velasco
	Physical Interpretation of Very Small Concentrations	H. Bauer
	Luminous Phenomena and Seismic Energy in the Central United States	J. Derr/ M. Persinger
	Photo Analysis of an Aerial Disc Over Costa Rica: New Evidence	R. Haines/J. Vallee
	A Scientific Inquiry into the Validity of Astrology	J. McGrew/R. McFall
	Planetary Influences on Human Behavior: Absurd for a Scientific Explanation?	A. Miller
	Five Arguments against Extraterrestrial Origin of Unidentified Flying Objects	J. Vallee
4:2	Using the Study of Anomalies To Enhance Critical Thinking in the Classroom	M. Swords
	Observations of Electromagnetic Signals Prior to California Earthquakes	M. Adams
	Bayesian Analysis of Random Event Generator Data	W. Jefferys
	Moslem Case of Reincarnation Type in Northern India: Analysis of 26 Cases	A. Mills
	Electromagnetic Disturbances Associated with Earthquakes	M. Parrot

- Extrasensory Interactions between Homo Sapiens and Microbes C. Pleass/N. Dey
 Correlation between Mental Processes and External Random Events H. Schmidt
 Phobias in Children Who Claim To Remember Previous Lives I. Stevenson
 A Gas Discharge Device for Investigating Focused Human Attention W. Tiller
 Radio Emissions from an Earthquake J. Warwick
- 5:1 The Cydonian Hypothesis J. Brandenburg et al.
 Cases in Burma, Thailand, and Turkey: Aspects of I. Stevenson's Research J. Keil
 Effects of Consciousness on the Fall of Dice: A Meta Analysis D. Radin/D. Ferrari
 The Wasgo or Sisiutl: A Cryptozoological Sea Animal M. Swords
 The Extraterrestrial Hypothesis Is Not That Bad R. Wood
 Toward a Second Degree Extraterrestrial Theory of UFOs J. Vallee
 Low Frequency Emissions: Earthquakes and Volcanic Eruptions in Japan T. Yoshino
- 5:2 Eccles's Model of Mind/Brain Interaction and Psychokinesis W. Giroladini
 Ball Lightning and St. Elmo's Fire as Forms of Thunderstorm Activity A. Grigor'ev et al.
 Social Scientific Paradigms for Investigating Anomalous Experience J. McClenon
 Count Population Profiles in Engineering Anomalies Experiments R. Jahn et al.
 Children Claiming Past Life Memories: Four Cases in Sri Lanka E. Haraldsson
- 6:1 Can the UFO Extraterrestrial Hypothesis and Vallee Hypotheses Be Reconciled? W. Bramley
 Learning for Discovery: Establishing the Foundations R. Domaigne
 On the Bayesian Analysis of REG Data (Response from W. Jefferys) Y. Dobyans
 Electrodynamical Activities and Their Role in the Organization of Body Pattern M. W. Ho et al.
- 6:2 Review of Approaches to the Study of Spontaneous Psi Experiences R. White
 Survival or SuperPsi?: Interchange Responses I. Stevenson/S. Braude
 The Psychokinesis Effect: Geomagnetic Influence, Age and Sex Differences L. Gissurarson
 Are Reincarnation Type Cases Shaped by Parental Guidance? S. Pasricha
- 6:3 Heim's Theory of Elementary Particle Structures T. Auerbach
 Better Blood through Chemistry: A Laboratory Replication of a Miracle M. Epstein
 The Gauquelin Effect Explained? Comments on Miller's Planetary Correlations S. Ertel
 The Gauquelin Effect Explained? A Rejoinder to Ertel's Critique A. Miller
 Ball Lightning Penetration into Closed Rooms: 43 Eyewitness Accounts A. Grigor'ev et al.
 A Series of Possibly Paranormal Recurrent Dreams I. Stevenson
- 6:4 Experiments in Remote Human/Machine Interaction B. Dunne et al.
 A Low Light Level Diffraction Experiment for Anomalies Research S. Jeffers et al.
 A New Look at Maternal Impressions: An Analysis of 50 Published Cases I. Stevenson
 Alternative Healing Therapy on Regeneration Rate of Salamander Forelimbs D. Wirth et al.
- 7:1 Accultured Topographical Effects of Shamanic Trance Consciousness P. Devereux
 Mainstream Sciences vs. Parasciences: Toward an Old Dualism? G. L. Eberlein
 Existence of Life and Homeostasis in an Atmospheric Environment S. Moriyama
 A Guide to UFO Research M. D. Swords
- 7:2 Non Causality as the Earmark of Psi H. Schmidt
 Adequate Epistemology for Scientific Exploration of Consciousness W. W. Harman
 Puzzling Eminence Effects Might Make Good Sense S. Ertel
 Comments on Puzzling Eminence Effects J. W. Nienhuys
 A Systematic Survey of Near Death Experiences in South India S. Pasricha
 The Willamette Pass Oregon UFO Photo Revisited: An Explanation I. Wieder
- 7:3 Near Death Experiences: Evidence for Life After Death? M. Schröter Kunhardt
 Analysis of the May 18, 1992, UFO Sighting in Gulf Breeze, Florida B. Maccabee
 Selection Versus Influence in Remote REG Anomalies Y. Dobyans

- | | |
|--|--------------------------|
| Dutch Investigation of the Gauquelin Mars Effect | J. Nienhuys |
| Comments on Dutch Investigations of the Gauquelin Mars Effect | S. Ertel |
| What Are Subtle Energies? | W. Tiller |
| 7:4 Explaining the Mysterious Sounds Produced by Very Large Meteor Fireballs | C. S. L. Keay |
| Neural Network Analyses of Consciousness Related Patterns | D. I. Radin |
| Applied Parapsychology: Studies of Psychics and Healers | S. A. Schouten |
| Birthmarks and Birth Defects Corresponding to Wounds on Deceased Persons | I. Stevenson |
| The Enemies of Parapsychology | R. McConnell |
| 8:1 Survey of the American Astronomical Society Concerning UFOs: Part 1 | P. Sturrock |
| Anatomy of a Hoax: The Philadelphia Experiment Fifty Years Later | J. Vallee |
| Healing and the Mind: Is There a Dark Side? | L. Dossey |
| Alleged Experiences Inside UFOs: An Analysis of Abduction Reports | V. Ballester Olmos |
| What I See When I Close My Eyes | R. Targ |
| 8:2 Survey of the American Astronomical Society Concerning UFOs: Part 2 | P. Sturrock |
| Series Position Effects in Random Event Generator Experiments | B. Dunne et al. |
| Re Examination of the Law of Conservation of Mass in Chemical Reactions | K. Volkamer et al. |
| The Genius Hypothesis : Exploratory Concepts for Creativity | E. Laszlo |
| 8:3 Survey of the American Astronomical Society Concerning UFOs: Part 3 | P. Sturrock |
| Strong Magnetic Field Detected Following a Sighting of an UFO | B. Maccabee |
| Complementary Healing Therapy for Patients with Type I Diabetes Mellitus | D. P. Wirth |
| Report of an Indian Swami Claiming to Materialize Objects | E. Haraldsson |
| 8:4 Scientific Analysis of Four Photos of a Flying Disk Near Lac Chauvet, France | Pierre Gu rin |
| A Linear Pendulum Experiment: Operator Intention on Damping Rate | R. D. Nelson |
| Applied Scientific Inference | P. A. Sturrock |
| The Mind Brain Problem | J. Beloff |
| 9:1 Unconventional Water Detection: Field Test of Dowsing in Dry Zones: Part 1 | H. Betz |
| Digital Video Analysis of Anomalous Space Objects | M. Carlotto |
| The Critical Role of Analytical Science in the Study of Anomalies | M. Epstein |
| Near Death Experiences in South India: A Systematic Survey | S. Pasricha |
| Human Consciousness Influence on Water Structure | L. Pyatnitsky/V. Fonkin |
| 9:2 Unconventional Water Detection: Field Test of Dowsing in Dry Zones: Part 2 | H. Betz |
| Semi molten Meteoric Iron Associated with a Crop Formation | W. Levengood/MJ. Burke |
| Experiments on a Possible gamma Emission Caused by a Chemical Process | V. Noninski et al. |
| The Effect of Paranormal Healing on Tumor Growth | F. Snel/P. van der Sijde |
| Psychokinetic Action of Young Chicks on the Path of an Illuminated Source | R. Peoch |
| Eddington s Thinking on the Relation between Science and Religion | A. Batten |
| Two Kinds of Knowledge: Maps and Stories | H. Bauer |
| 9:3 Experiments on Claimed Beta Particle Emission Decay | V. Noninski et al. |
| Assessing Commonalities in Randomly Paired Individuals | T. Rowe et al. |
| Anomalously Large Body Voltage Surges on Exceptional Subjects | W. Tiller et al. |
| Six Modern Apparitional Experiences | I. Stevenson |
| Viewing the Future: A Pilot Study with an Error Detecting Protocol | R. Targ et al. |
| Could Extraterrestrial Intelligences Be Expected to Breathe Our Air? | M. Swords |
| 9:4 Decision Augmentation Theory: Applications to Random Number Generators | E. May |
| Extrasensory Perception of Subatomic Particles & Referee Interchange (Dobyns) | S. Phillips |
| North American Indian Effigy Mounds | A. Apostol |
| A Holistic Aesthetic for Science | B. Kirchoff |

- 10:1 An Assessment of the Evidence for Psychic Functioning
 Evaluation of a Program on Anomalous Mental Phenomena
 CIA Initiated Remote Viewing Program at Stanford Research Institute
 Remote Viewing at Stanford Research Institute in the 1970s: A Memoir
 American Institutes for Research Review of the STAR GATE Program
 FieldREG Anomalies in Group Situations
 Anomalous Organization of Random Events by Group Consciousness
 J. Utts
 R. Hyman
 H. Puthoff
 R. Targ
 E. May
 R. Nelson et al.
 D. Radin et al.
- 10:2 Critical Review of the Cold Fusion Effect
 Do Nuclear Reactions Take Place Under Chemical Stimulation?
 Claimed Transmutation of Elements Caused by a Chemical Process
 Selection versus Influence Revisited: New Methods and Conclusions
 Illegitimate Science? A Personal Story
 Anomalous Phenomena Observed in the Presence of a Brazilian Sensitive
 E. Storms
 J. Bockris et al.
 V. Noninski et al.
 Y. Dobyns
 B. Maccabee
 S. Krippner et al.
- 10:3 Mass Modification Experiment Definition Study
 Atmospheric Mass Loss on Mars and the Consequences
 Exploring Correlations between Local Emotional and Global Emotional Events
 Archetypes, Neurognosis and the Quantum Sea
 R. Forward
 H. Lammer
 D. Bierman
 C. Laughlin
- 10:4 Distance Healing of Patients with Major Depression
 Cases of the Reincarnation Type: Evaluation of Some Indirect Evidence
 Enhanced Congruence between Dreams and Distant Target Material
 Recent Responses to Survival Research (Responses by Braude & Wheatley)
 Toward a Philosophy of Science in Women's Health Research
 B. Greyson
 J. Keil
 S. Krippner et al.
 R. Almeder
 A. Lettieri
- 11:1 Biased Data Selection in Mars Effect Research
 Is the Mars Effect Genuine?
 Fortean Phenomena on Film: Evidence or Artifact?
 Wishing for Good Weather: A Natural Experiment in Group Consciousness
 Empirical Evidence for a Non-Classical Experimenter Effect
 Consciousness, Causality, and Quantum Physics
 S. Ertel/K. Irving
 P. Kurtz et al.
 R. Lange/J. Houran
 R. Nelson
 H. Walach/S. Schmidt
 D. Pratt
- 11:2 Anomalous Cognition Experiments and Local Sidereal Time
 Evidence that Objects on Mars are Artificial in Origin
 The Astrology of Time Twins: A Re-Analysis & Referee Interchange (Roberts)
 Unconscious Perception of Future Emotions: An Experiment in Presentiment
 A Bayesian Maximum Entropy Approach to Hypothesis Testing
 Planetary Diameters in the Surya Siddhanta
 Science of the Subjective
 S. J. P. Spottiswoode
 M. Carlotto
 C. French et al.
 D. Radin
 P. Sturrock
 R. Thompson
 R. Jahn/B. Dunne
- 11:3 Accessing Anomalous States of Consciousness with Binaural Beat Technology
 The Mars Effect As Seen by the Committee PARA
 Astrology and Sociability: A Comparative Psychological Analysis
 Comparison between Children with and without Previous Life Memories
 Did Life Originate in Space? Discussion of Implications of Recent Research
 Correlations of Random Binary Sequences with Pre- Stated Operator Intention
 The Hidden Side of Wolfgang Pauli: An Encounter with Depth Psychology
 F. Holmes Atwater
 J. Dommanget
 S. Fuzeau Braesch
 E. Haraldsson
 A. Mugan
 R. Jahn et al.
 H. Atmanspacher/
 Primas
- 11:4 Topographic Brain Mapping of UFO Experiencers
 Toward a Model Relating Empathy, Charisma, and Telepathy
 The Zero Point Field and the NASA Challenge of Create the Space Drive
 Motivation and Meaningful Coincidence: Further Examination of Synchronicity
 A Critique of Arguments Offered against Reincarnation
 The Archaeology of Consciousness
 N. Don/G. Moura
 J. Donovan
 B. Haisch/A. Rueda
 T. Rowe et al.
 R. Almeder
 P. Devereux

- 12:1 Gender Differences in Human/Machine Anomalies B. Dunne
 Statement Validity Analysis of Jim Ragsdale Story : Roswell Implications J. Houran/S. Porter
 Experiment Effects in Scientific Research: How Widely Are They Neglected? R. Sheldrake
 Roswell Anatomy of a Myth K. Jeffery
 A Different View of Roswell Anatomy of a Myth M. Swords
 Critique of Roswell Anatomy of a Myth R. Woods
- 12:2 Physical Evidence Related to UFO Reports P. A. Sturrock et al.
 Empirical Evidence Against Decision Augmentation Theory Y. Dobyns/R. Nelson
 Cases of Reincarnation in Northern India with Birthmarks and Birth Defects S. Pasricha
 Can the Vacuum Be Engineered for Spaceflight Applications? Overview. H. E. Puthoff
 Four Paradoxes Involving the Second Law of Thermodynamics D. Sheehan
 The Paranormal Is Not Excluded from Physics O. Costa de Beauregard
- 12:3 Estimates of Optical Power Output in Six Cases of Unexplained Aerial Objects J. Vallee
 Analyses in Ten Cases of Unexplained Aerial Objects with Material Samples J. Vallee
 Do Near Death Experiences Provide Evidence for Survival of Human Personality E. Cook et al.
 Anomalous Statistical Influence Depends on Details of Random Process M. Ibison
 FieldREG II: Consciousness Field Effects: Replications and Explorations R. D. Nelson et al.
 Biological Effects of Very Low Frequency (VLF) Atmospherics in Humans A. Schienle et al.
- 12:4 The Timing of Conscious Experience: Causality Violating F. A. Wolf
 Double-Slit Diffraction Experiment of Investigate Consciousness Anomalies M. Ibison/
 S. Jeffers
 TechnoDowsing: A Physiological Response System to Improve Psi Training P. Stevens
 Physical Measurement of Episodes of Focused Group Energy W. Rowe
 Experimental Studies of Telepathic Group Communication of Emotions J. Dalkvist/
 Westerlund
 Strategies for Dissenting Scientists B. Martin
- 13:1 Significance Levels for the Assessment of Anomalous Phenomena R. A. J. Matthews
 Retrotransposons as Engines of Human Bodily Transformation C. A. Kelleher
 A Rescaled Range Analysis of Random Events F. Pallikari/E. Boller
 Subtle Domain Connections to the Physical Domain Aspect of Reality W. A. Tiller
 Parapsychology in Intelligence: A Personal Review and Conclusions K. A. Kress
 Dreaming Consciousness: More Than a Bit Player in the Mind/Body Problem M. Ullman
- 13:2 The Effect of Healing with Intent on Pepsin Enzyme Activity T. Bunnell
 Electronic Device-Mediated pH Changes in Water W. Dibble/W. Tiller
 Variations on the Foundations of Dirac's Quantum Physics J. Edmonds
 Do Cases of the Reincarnation Type Show Similar Features over Many Years? J. Keil/I. Stevenson
 Optical Power Output of an Unidentified High Altitude Light Source B. Maccabee
 Registration of Actual and Intended Eye Gaze: Correlation with Spiritual Beliefs G. Schwartz/
 L. Russek
 Real Communication? Report on a SORRAT Letter Writing Experiment I. Grattan Guinness
 What are the Irreducible Components of the Scientific Enterprise? I. Stevenson
 Anomalies in the History of Relativity I. McCausland
 Magic of Signs: A Nonlocal Interpretation of Homeopathy H. Walach
- 13:3 Second Sight and Family History: Pedigree and Segregation Analyses S. Cohn
 Mound Configurations on the Martian Cydonia Plain H. Crater/S. McDaniel
 Geomorphology of Selected Massifs on the Plains of Cydonia, Mars D. Pieri
 Atmosphere or UFO? A Response to the 1997 SSE Review Panel Report B. Maccabee
 An Unusual Case of Stigmatization M. Margnelli
 Methuselah: Oldest Myth. or Oldest Man? L. McKague

- Analysis of Technically Inventive DreamLike Mental Imagery
Exploring the Limits of Direct Mental Influence: Two Studies B. Towe/Randall/May
C. Watt et al.
- 13:4 Experimental Systems in MindMatter Research R. Morris
Basic Elements and Problems of Probability Theory H. Primas
The Significance of Statistics in MindMatter Research R. Utts
Introductory Remarks on Large Deviations Statistics Amann/Atmanspacher
p-adic Information Spaces, Small Probabilities and Anomalous Phenomena A. Khrennikov
Towards an Understanding of the Nature of Racial Prejudice Hoyle/Wickramasinghe
Clyde Tombaugh, Mars and UFOs M. Swords
- 14:1 Investigating Deviations from Dynamical Randomness with Scaling Indices Atmanspacher et al.
Valentich Disappearance: New Evidence and New Conclusion R. Haines/P. Norman
Protection of Mice from Tularemia with Ultra Low Agitated Dilutions W. Jonas/D. Dillner
The Correlation of the Gradient of Shannon Entropy and Anomalous Cognition Spottiswoode/Faith
Contributions to Variance in REG Experiments: ANOVA Models R. Nelson et al.
Publication Bias: The File Drawer Problem in Scientific Inference J. Scargle
Remote Viewing in a Group Setting R. Targ/J. Katra
- 14:2 Overview of Several Theoretical Models on PEAR Data Y. Dobyans
The Ordering of Random Events by Emotional Expression R. Blasband
Energy, Fitness and Information Augmented EMFs in *Drosophila melanogaster* M. Kohane/
W. Tiller
A Dog That Seems To Know When His Owner Is Coming Home R. Sheldrake/P. Smart
What Can Elementary Particles Tell Us about the World in Which We Live? R. Bryan
Modern Physics and Subtle Realms: Not Mutually Exclusive R. Klauber
- 14:3 Plate Tectonics: A Paradigm Under Threat D. Pratt
The Effect of the Laying On of Hands on Transplanted Breast Cancer in Mice Bengston/Krinsley
Stability of Assessments of Paranormal Connections in Reincarnation Type Cases I. Stevenson/J. Keil
ArtREG: A Random Event Experiment Utilizing Picture Preference Feedback R. G. Jahn et al.
Can Population Growth Rule Out Reincarnation? D. Bishai
The Mars Effect Is Genuine S. Ertel/K. Irving
Bulky Mars Effect Hard To Hide S. Ertel
What Has Science Come To? H. Arp
- 14:4 Mind/Machine Interaction Consortium: PortREG Replication Experiments Jahn/Mischo/
Vaitl et al.
Unusual Play in Young Children Who Claim to Remember Previous Lives I. Stevenson
A Scale to Measure the Strength of Children's Claims of Previous Lives J. B. Tucker
Reanalysis of the 1965 Hefl in UFO Photos Druffel/Wood/
Kelson
Should You Take Aspirin To Prevent Heart Attack? J. M. Kauffman
- 15:1 The Biomedical Significance of Homocysteine K. McCully
20th and 21st Century Science: Reflections and Projections R. G. Jahn
To Be Or Not To Be! A Paraphysics for the New Millennium J. E. Beichler
Science of the Future in Light of Alterations of Consciousness I. Barušs
Composition Analysis of the Brazil Magnesium P. A. Sturrock
Does Recurrent ISP Involve More Than Cognitive Neuroscience? J. C. Terrillon/
S. Marques Bonham
- 15:2 The Scole Investigation: Critical Analysis of Paranormal Physical Phenomena M. Keen
Biophotons and Biocommunication R. VanWijk
Scalar Waves: Theory and Experiments K. Meyl

- Commentary: On Existence of K. Meyl's Scalar Waves G. W. Bruhn
 Cases of the Reincarnation Type in South India: Why So Few Reports? S. K. Pasricha
 Mind, Matter, and Diversity of Stable Isotopes J. P. Pui/
 A. A. Berezin
 Are the Apparitions of Medjugorje Real? J. P. Pandarakalam
 Where Do We File Flying Saucers? Archivist and Uncertainty Principle H. Evans
 The Bakken: A Library and Museum of Electricity in Life D. Stillings
- 15:3 A Modular Model of Mind/Matter Manifestations (M5) R. G. Jahn/B. J. Dunne
 The Speed of Thought: Complex Spacetime Metric and Psychic Phenomenon E. A. Rauscher/
 R. Targ
 Failure to Replicate Electronic Voice Phenomenon I. Barušs
 Experimental Study on Precognition Vasilescu/Vasilescu
 Unexplained Temporal Coincidence of Crystallization Constain/Davies
- 15:4 The Challenge of Consciousness R. G. Jahn
 Anomalies and Surprises H. H. Bauer
 Earth Geodynamic Hypotheses Updated N. C. Smoot
 Unexplained Weight Gain Transients at the Moment of Death L. E. Hollander, Jr.
 Physico-Chemical Properties of Water Following Exposure to Resonant Circuits C. Cardella et al.
- 16:1 Can Physics Accommodate Clairvoyance, Precognition, and Psychokinesis? R. Shoup
 The Pineal Gland and the Ancient Art of Iatromathematica F. McGillion
 Confounds in Deciphering the Ramey Memo from the Roswell UFO Case J. Houran/
 K. D. Randle
 The Pathology of Organized Skepticism L. D. Leiter
 Aspects of the Wave Mechanics of Two Particles in a Many Body Quantum System Y. S. Jain
 Microscopic Theory of a System of Interacting Bosons: A Unifying New Approach Y. S. Jain
 Unification of the Physics of Interacting Bosons and Fermions Y. S. Jain
 The Pathology of Organized Skepticism L. D. Leiter
- 16:2 Arguing for an Observational Theory of Paranormal Phenomena J. M. Houtkooper
 Differential Event Related Potentials to Targets and Decoys in Guessing Task McDonough/
 Don/Warren
 Stigmatic Phenomena: An Alleged Case in Brazil S. Krippner
 The Case for the Loch Ness Monster: The Scientific Evidence H. H. Bauer
 What's an Editor To Do? H. H. Bauer
- 16:3 M*: Vector Representation of the Subliminal Seed Regime of M5 R. G. Jahn
 Can Longitudinal Electromagnetic Waves Exist? G. W. Bruhn
 Development of Certainty about the Deceased in Reincarnation Case in Lebanon Haraldsson/
 Izzeddin
 Manifestation and Effects of External Qi of Yan Xin Life Science Technology Yan et al.
 FaceLike Feature at West Candor Chasma, Mars MGS Image AB108403 Crater/Levasseur
 A Search for Anomalies W. R. Corliss
 Common Knowledge about the Loch Ness Monster: Television, Videos, and Film H. H. Bauer
- 16:4 Relationships Between Random Physical Events and Mass Human Attention D. Radin
 Coherent Consciousness and Reduced Randomness: Correlations on 9/11/2001 R. D. Nelson
 Was There Evidence of Global Consciousness on September 11, 2001? J. Scargle
 A Dog That Seems To Know When His Owner Is Coming Home D. Radin
 An Investigation on the Activity Pattern of Alchemical Transmutations J. Perez Pariente
 Anomalies in Relativistic Rotation R. D. Klauber
 The Vardigris, Perhaps Another Indicator of the Non-Locality of Consciousness L. D. Leiter
 Review of the Perrott-Warrick Conference Held at Cambridge 3-5 April 2000 B. Carr

- Wavelike Coherence and CPT Invariance: Sesames of the Paranormal O. Costa de
Beauregard
- Why Only 4 Dimensions Will Not Explain Relationships in Precognition Rauscher/Targ
- 17:1 Problems Reporting Anomalous Observations in Anthropology C. Richards
The Fringe of American Archaeology A. B. Kehoe
Rocks That Crackle and Sparkle and Glow: Strange Pre Earthquake Phenomena F. T. Freund
Poltergeists, Electromagnetism and Consciousness W. G. Roll
AIDS: Scientific or Viral Catastrophe? N. Hodgkinson
- 17:2 Information and Uncertainty in Remote Perception Research B. J. Dunne/R. G. Jahn
Problems of Reproducibility in Complex Mind/Matter Systems H. Atmanspacher
Parapsychology: Science or Pseudo Science? M. C. Mousseau
The Similarity of Features of Reincarnation Type Cases Over Many Years: I. Stevenson/
A Third Study E. Haraldsson
Communicating with the Dead: The Evidence Ignored. Why Paul Kurtz is Wrong M. Keen
Purported Anomalous Perception in a Highly Skilled Individual: G. E. Schwartz/
Observations, Interpretations, Compassion L. A. Nelson/L. G. Russek
Proof Positive Loch Ness Was an Ancient Arm of the Sea E. M. Dougherty
- 17:3 Radiation Hormesis: Demonstrated, Deconstructed, Denied, J. M. Kauffman
Dismissed, and Some Implications for Public Policy
Video Analysis of an Anomalous Image Filmed during Apollo 16 H. Nakamura
The Missing Science of Ball Lightning D. J. Turner
Pattern Count Statistics for the Analysis of Time Series in Mind/Matter Studies W. Ehm
Replication Attempt: No Development of pH or Temperature Oscillations L. I. Mason/
in Water Using Intention Imprinted Electronic Devices R. P. Patterson
Three Cases of the Reincarnation Type in the Netherlands T. Rivas
- 17:4 Testing a Language Using Parrot for Telepathy R. Sheldrake/
A. Morgana
Skin Conductance Prestimulus Response: Analyses, Artifacts and a Pilot Study S. J. P. Spottiswode
/E. C. May
Effects of Frontal Lobe Lesions on Intentionality and Random Physical Phenomena M. Freedman/S.
Jeffers/K. Saeger/
/M. Binns/S. Black
The Use of Music Therapy as a Clinical Intervention for Physiologist D. S. Berger/
Functional Adaptation Media Coverage of Parapsychology D. J. Schneck/
and the Prevalence of Irrational Beliefs M. C. Mousseau
The Einstein Mystique I. McCausland
- 18:1 A Retrospective on the Journal of Scientific Exploration B. Haisch/M. Sims
Anomalous Experience of a Family Physician J. H. Armstrong, Sr.
Historical Overview & Basic Facts Involved in the Sasquatch or Bigfoot Phenomenon J. Green
The Sasquatch: An Unwelcome and Premature Zoological Discovery? J. A. Bindernagel
Midfoot Flexibility, Fossil Footprints, and Sasquatch Steps: D. J. Meldrum
New Perspectives on the Evolution of Bipedalism
Low Carbohydrate Diets J. M. Kauffman
- 18:2 Analysis of the Columbia Shuttle Disaster J. P. MacLean/
Anatomy of a Flawed Investigation in a Pathological Organization G. Campbell/
S. Seals
Long Term Scientific Survey of the Hessdalen Phenomenon M. Teodorani
Electrodermal Presentiments of Future Emotions D. I. Radin
Intelligent Design: Ready for Prime Time? A. D. Gishlick

- On Events Possibly Related to the Brazil Magnesium Entropy and Subtle Interactions Can a Single Bubble Sink a Ship? P. Kaufmann/P. A. Sturrock
G. Moddel
D. Deming
- 18:3 The MegaREG Experiment Y. H. Dobyns et al.
Replication and Interpretation Time Series Analysis of a Catalog of UFO Events: Evidence of a Local sidereal Time Modulation P. A. Sturrock
Challenging Dominant Physics Paradigms J. M. Campanario/B. Martin
Ball Lightning and Atmospheric Light Phenomena: A Common Origin? T. Wessel Berg
- 18:4 Sensors, Filters, and the Source of Reality R. G. Jahn/B. J. Dunne
The Hum: An Anomalous Sound Heard Around the World D. Deming
Experimental Test of Possible Psychological Benefits of Past Life Regression K. Woods/I. Baruš
Inferences from the Case of Ajendra Singh Chauhan: The Effect of Parental Questioning, of Meeting the Previous Life Family, an Attempt To Quantify Probabilities, and the Impact on His Life as a Young Adult A. Mills
Science in the 21st Century: Knowledge Monopolies and Research Cartels H. H. Bauer
Organized Skepticism Revisited L. D. Leiter
- 19:1 The Effect of a Change in Pro Attitude on Paranormal Performance: A Pilot Study Using Naive and Sophisticated Skeptics L. Storm/
M. A. Thalbourne
The Paradox of Planetary Metals Y. Almirantis
An Integrated Alternative Conceptual Framework to Heat Engine Earth, Plate Tectonics, and Elastic Rebound S. T. Tassos/
D. J. Ford
Children Who Claim to Remember Previous Lives: Cases with Written Records Made before the Previous Personality Was Identified H. H. J. rgen Keil/
J. B. Tucker
- 19:2 Balls of Light: The Questionable Science of Crop Circles F. Grassi/C. Cocheo/
P. Russo
Children of Myanmar Who Behave like Japanese Soldiers: A Possible Third Element in Personality I. Stevenson/J. Keil
Challenging the Paradigm B. Maccabee
The PEAR Proposition R. G. Jahn/B. J. Dunne
Global Warming, the Politicization of Science, and Michael Crichton's State of Fear D. Deming
- 19:3 A State of Belief Is a State of Being Charles Eisenstein
Anomalous Orbic Spirit Photographs? A Conventional Optical Explanation G. E. Schwartz/
K. Creath
Some Bodily Malformations Attributed to Previous Lives S. K. Pasricha et al.
A State of Belief Is a State of Being C. Eisenstein
HIV, As Told by Its Discoverers H. H. Bauer
Kicking the Sacred Cow: Questioning the Unquestionable and Thinking the Impermissible H. H. Bauer
- 19:4 Among the Anomalies J. Clark
What Biophoton Images of Plants Can Tell Us about Biofields and Healing K. Creath/
G. E. Schwartz
Demographic Characteristics of HIV: I. How Did HIV Spread? H. H. Bauer
- 20:1 Half a Career with the Paranormal I. Stevenson
Pure Inference with Credibility Functions M. Aickin
Questioning Answers on the Hessdalen Phenomenon M. Leone
Hessdalen Research: A Few NonQuestioning Answers M. Teodorani
Demographic Characteristics of HIV: II. How Did HIV Spread H. H. Bauer
Organized Opposition to Plate Tectonics: D. Pratt
The New Concepts in Global Tectonics Group

- 20:2 Time Normalized Yield: A Natural Unit for Effect Size in Anomalies Experiments R. D. Nelson
 The Relative Motion of the Earth and the Ether Detected S. J. G. Gift
 A Unified Theory of Ball Lightning and Unexplained Atmospheric Lights P. F. Coleman
 Experimenter Effects in Laboratory Tests of ESP and PK Using a Common Protocol C. A. Roe/
 R. Davey/P. Stevens
 Demographic Characteristics of HIV: III. Why Does HIV Discriminate by Race H. H. Bauer
- 20:3 Assessing the Evidence for Mind-Matter Interaction Effects D. Radin et al.
 Experiments Testing Models of Mind-Matter Interaction D. Radin
 A Critique of the Parapsychological Random Number Generator Meta-Analyses of Radin and Nelson M. H. Schub
 Comment on: A Critique of the Parapsychological Random Number Generator Meta-Analyses of Radin and Nelson J. D. Scargle
 The Two-Edged Sword of Skepticism: Occam's Razor and Occam's Lobotomy H. H. Bauer
- 20:4 Consciousness and the Anomalous Organization of Random Events: The Role of Absorption L. A. Nelson/
 G. E. Schwartz
 Ufology: What Have We Learned? M. D. Swords
- 21:1 Linking String and Membrane Theory to Quantum Mechanics & Special Relativity Equations, Avoiding Any Special Relativity Assumptions M. G. Hocking
 Response of an REG-Driven Robot to Operator Intention R. G. Jahn et al.
 Time Series Power Spectrum Analysis of Performance in Free Response Anomalous Cognition Experiments P. A. Sturrock/
 S. J. Spottiswoode
 A Methodology for Studying Various Interpretations of the N,N-dimethyltryptamine-Induced Alternate Reality M. A. Rodriguez
 An Experimental Test of Instrumental Transcommunication I. Baruš
 An Analysis of Contextual Variables and the Incidence of Photographic Anomalies at an Alleged Haunt and a Control Site D. B. Terhune et al.
 The Function of Book Reviews in Anomalistics G. H. H. velmann
 Occam's Razor and Its Improper Use D. Gernert
 Science: Past, Present, and Future H. H. Bauer
- 21:2 The Role of Anomalies in Scientific Exploration P. A. Sturrock
 The Yantra Experiment Y. H. Dobyns et al.
 An Empirical Study of Some Astrological Factors in Relation to Dog Behaviour S. Fuzeau-Braesch/
 Differences by Statistical Analysis & Compared with Human Characteristics J. B. Denis
 Exploratory Study: The Random Number Generator and Group Meditation L. I. Mason et al.
 Statistical Consequences of Data Selection Y. H. Dobyns
- 21:3 Dependence of Anomalous REG Performance on Run Length R. G. Jahn/Y. H. Dobyns
 Dependence of Anomalous REG Performance on Elemental Binary Probability R. G. Jahn/
 J. C. Valentino
 Effect of Belief on Psi Performance in a Card Guessing Task K. Walsh/G. Moddel
 An Automated Online Telepathy Test R. Sheldrake/M. Lambert
 Three Logical Proofs: The Five-Dimensional Reality of Space-Time J. E. Beichler
 Children Who Claim to Remember Previous Lives: Past, Present, & Future Research J. B. Tucker
 Memory and Precognition J. Taylor
 AIDS, Cancer and Arthritis: A New Perspective N. Hodgkinson
 Online Historical Materials about Psychic Phenomena C. S. Alvarado
- 21:4 Synthesis of Biologically Important Precursors on Titan Sam H. Abbas/D. Schulze
 Is the Psychokinetic Effect as Found with Binary Random Number Generators Suitable to Account for Mind-Brain Interaction? Makuch/Wolfgang
 Helfrich

- Explorations in Precognitive Dreaming Dale E. Graff
 Climate Change Reexamined Joel M. Kauffman
 Franklin Wolff's Mathematical Resolution of Existential Issues Imants Barušs
 From Healing to Religiosity Kevin W. Chen
- 22:1 Theme and Variations: The Life and Work of Ian Stevenson Emily W. Kelly/Carlos S. Alvarado
 Ian Stevenson: Recollections Kerr L. White
 Reflections on the Life and Work of Ian Stevenson Alan Gauld
 Ian Stevenson and Cases of the Reincarnation Type Jim B. Tucker
 Ian Stevenson and the Modern Study of Spontaneous ESP Experiences Carlos S. Alvarado/
 Nancy L. Zingrone
 Bruce Greyson
 Erlendur Haraldsson
 E. F. Kelly/E. W. Kelly
 M.M. Abu Izzeddin
 Mary Rose Barrington
 Stephen E. Braude
 Bernard Carr
 Lisette Coly
 Stuart J. Edelstein
- Ian Stevenson's Contributions to Near Death Studies
 Ian Stevenson's Contributions to the Study of Mediumship
 Where Science and Religion Intersect: The Work of Ian Stevenson
 The Gentle American Doctor
 Professor Ian Stevenson: Some Personal Reminiscences Doris Kuhlmann Wilsdorf
 Ian Stevenson: A Recollection and Tribute L. David Leiter
 Ian Stevenson and His Impact on Foreign Shores Antonia Mills
 Ian Stevenson: Gentleman and Scholar
 The Quest for Acceptance
 Ian Stevenson: Founder of the Scientific Investigation of Human Reincarnation
 Remembering My Teacher John Palmer
 Comments on Ian Stevenson, M.D., Director of the Division of Personality Studies and Pioneer of Reincarnation Research Satwant K. Pasricha
 Ian Stevenson: Reminiscences and Observations Tom Shroder
 Dr. Ian Stevenson: A Multifaceted Personality John Smythies
 A Good Question Rex Stanford
 The Fight for the Truth Peter A. Sturrock
 Ian Stevenson: A Man from Whom We Should Learn Ruth B. Weeks
 Ian Stevenson and the Society for Scientific Exploration Donald J. West
 Ian Stevenson's Early Years in Charlottesville Ray Westphal
 Tribute to a Remarkable Scholar
 An Ian Stevenson Remembrance
- 22:2 Meditation on Consciousness I. Ivtzan
 An Exploration of Degree of Meditation Attainment in Relation to Psychic Awareness with Tibetan Buddhists S. M. Roney Dougal
 Thematic Analysis of Research Mediums' Experiences of J. Solfvin/J. Fox
 Discarnate Communication A. J. Rock/J. Beischel
 Change the Rules! G. E. Schwartz
 Proposed Criteria for the Necessary Conditions for manicjourneying Imagery R. G. Jahn/B. J. Dunne
 Scalar Wave Effects according to Tesla & Far Range Transponder by K. Meyl A. J. Rock/S. Krippner
 How to Reject Any Scientific Manuscript D. Khilke
 D. Gernert
- 22:3 Unusual Atmospheric Phenomena Observed Near the Channel Islands, United Kingdom, 23 April 2007 J. F. Baure/D. Clarke/
 P. Fuller/M. Shough
 The GCP Event Experiment: Design, Analytical Methods, Results P. Bancel/R. Nelson
 New Insights into the Links between ESP and Geomagnetic Activity Adrian Ryan
 Phenomenology of N,N Dimethyltryptamine Use: A Thematic Analysis C. Cott/A. Rock
 Altered Experience Mediates the Relationship between Schizotypy and Mood Disturbance during Shamanic Like Journeying A. Rock/G. Abbott/
 N. Kambouropoulos
 Persistence of Past Life Memories: Study of Adults Who Claimed in Their Childhood To Remember a Past Life E. Haraldsson

- 22:4 Energy, Entropy, and the Environment (How to Increase the First by Decreasing the Second to Save the Third) D. P. Sheehan
 Effects of Distant Intention on Water Crystal Formation: A Triple Blind Replication D. Radin/N. Lund/
 M. Emoto/T. Kizu
 Changes in Physical Strength During Nutritional Testing C. F. Buhler/P. R. Burgess/
 E. VanWagoner
 Investigating Scopesthesia: Attentional Transitions, Controls and Error Rates in Repeated Tests Rupert Sheldrake/
 Pamela Smart
 Shakespeare: The Authorship Question, A Bayesian Approach P. A. Sturrock
 An Anomalous Legal Decision Richard Blasband
- 23:1 A New Experimental Approach to Weight Change Experiments at the Moment of Death with a Review of Lewis E. Hollander's Experiments on Sheep Masayoshi Ishida
 An Automated Test for Telepathy in Connection with Emails R. Sheldrake/L. Avraamides
 Brain and Consciousness: The Ghost in the Machines John Smythies
 In Defense of Intuition: Exploring the Physical Foundations of Spontaneous Apprehension Ervin Laszlo
- 23:2 Appraisal of Shawn Carlson's Renowned Astrology Tests Suitbert Ertel
 A Field Theoretic View of Consciousness: Reply to Critics D. W. Orne Johnson/
 Robert M. Oates
 Super Psi and the Survivalist Interpretation of Mediumship Michael Sudduth
 Perspectival Awareness and Postmortem Survival Stephen E. Braude
- 23:3 Exploratory Evidence for Correlations between Entrained Mental Coherence and Random Physical Systems Dean Radin/
 F. Holmes Atwater
 Scientific Research between Orthodoxy and Anomaly Harald Atmanspacher
- 23:4 Cold Fusion: Fact or Fantasy? M. E. Little/S. R. Little
 Extraordinary Evidence Replication Effort M. E. Little/S. R. Little
 Survey of the Observed Excess Energy and Emissions in Lattice Assisted Nuclear Reactions Mitchell R. Swartz
- 24:1 Rebuttal to Claimed Refutations of Duncan MacDougall's Experiment on Human Weight Change at the Moment of Death Masayoshi Ishida
 Unexpected Behavior of Matter in Conjunction with Human Consciousness Dong Shen
 Randomized Expectancy Enhanced Placebo Controlled Trial of the Impact of Quantum Bioenergetics and Mental Boundaries on Affect Adam J. Rock/
 Fiona E. Permezel
 A Case of the Reincarnation Type in Turkey Suggesting Strong Paranormal Information Involvements J. rgen Keil
 Questions of the Reincarnation Type J. rgen Keil
 How To Improve the Study and Documentation of Cases of the Reincarnation Type? A Reappraisal of the Case of Kemal Atasoy Vitor Moura Visoni
- 24:2 Importance of a Psychosocial Approach for a Comprehensive Understanding of Mediumship E. Maraldi/
 F. Machado/W. Zangari
 Investigating Mental Mediums: Research Suggestions from the Historical Literature Carlos S. Alvarado
 Advantages of Being Multiplex Michael Grosso
 Some Directions for Mediumship Research Emily W. Kelly
 Parapsychology in France after May 1968: A History of GERP Renaud Evrard
 Remy Chauvin (1913-2009) Renaud Evrard
- 24:3 Anomalous Magnetic Field Activity During a Bioenergy Healing Experiment Margaret M. Moga/
 William F. Bengston
 Further Evidence of the Possibility of Exploiting Anticipatory Physiological Signals To Assist Implicit Intuition of Random Events Patrizio Tressoldi/
 M. Martinelli/Laura Scartezzini/
 Stefano Massaccesi

- Fire in Copenhagen and Stockholm. Indridason's and Swedenborg's Remote Viewing Experiences E. Haraldsson/
Johan L. F. Gerding
- Soal's Target Digits: Statistical Links Back to the Source He Reported After All Roderick Garton
- Common Paranormal Belief Dimensions Neil Dagnall/Andrew Parker/
Gary Munley/K. Drinkwater/
Antonio Giuditta
- The 1907 Psychokinetic Experiments of Professor Filippo Bottazzi
- 24:4 Psi in a Skeptic's Lab: A Successful Replication of Ertel's Ball Selection Test Suitbert Ertel
Anticipatory Alarm Behavior in Bengalese Finches Fernando Alvarez
The Daniel Experiment: Sitter Group Contributions Mike Wilson/
with Field RNG and MESA Recordings Bryan J. Williams/Timothy M. Harte/
William J. Roll
Field RNG Data Analysis, Based on Viewing the Japanese Takeshi Shimizu/
Movie Departures (Okuribito) Masato Ishikawa
The Healing Connection: EEG Harmonics, Entrainment, Luke Hendricks/
and Schumann's Resonance William F. Bengston/Jay Gunkelman
Laboratory Psi Effects May Be Put to Practical Use James Carpenter
- 25:1 Are There Stable Mean Values, and Relationships between Them, in Statistical Parapsychology? Wolfgang Helfrich
Exploring the Relationship between Tibetan Serena Roney Dougal/
Meditation Attainment and Precognition /Jerry Solfvin
A Faulty PK Meta Analysis Wilfried Kugel
- Karhunen-Löve Transform for Detecting Ionospheric Total Electron Content (TEC) Anomalies Jyh Woei Lin
Prior to the 1999 Chi-Chi Earthquake, Taiwan Carlos S. Alvarado
Eusapia Palladino: An Autobiographical Essay Adair Menezes Jr./
Mental Health of Mediums and Differential Diagnosis between Alexander Moreira Almeida
Mediumship and Mental Disorders
- 25:2 Objective Analyses of Real Time and Audio Instrumental Transcommunication and Matched Control Sessions: Mark Boccuzzi/
A Pilot Study Julie Beischel
- Measurement Controls in Anomalies Research Walter E. Dibble Jr./William A. Tiller
Hessdalen Lights and Piezoelectricity from Rock Strain Gerson S. Paiva/C. A. Taft
Retroactive Event Determination and the Interpretation of Macroscopic Quantum Superposition States in Sky Nelson
Consistent Histories and Relational Quantum Mechanics
- Thoughts about Thought Bundles: A Commentary on Jürgen Keil's Michael Nahm/
Paper Questions of the Reincarnation Type Dieter Hassler
Reply to the Nahm and Hassler Commentary on Jürgen Keil's Jürgen Keil
Paper Questions of the Reincarnation Type
- The Desire for the Development of Flight: A Recurrent Theme for Advanced Civilizations? B. Reiswig/
D. Schulze-Makuch
- 25:3 Reflections on the Context of Near-Death Experiences Michael Nahm
An Important Subject at the Institut Métapsychique International: Guilio Caratelli
Jeanne LaPlante Maria Luisa Felici
A Baby Sea Serpent No More: Reinterpreting Hagelund's M. A. Woodley/
Juvenile Cadborosaur Report D. Naish/C. A. McCormick
Avian Formation on a South-Facing Slope Along the Northwest Michael A. Dale/George J. Haas
Rim of the Argyre Basin James S. Miller/William R. Saunders
A. J. Cole/Susan Orosz/Joseph M. Friedlander
- Guest Editorial: On Wolverines and Epistemological Totalitarianism Etzel Cardeña

- 25:4 Revisiting the Ganzfeld Debate: A Basic Review and Assessment
The Global Consciousness Project: Identifying the Source of Psi
Bryan J. Williams
Edwin C. May/
S. James P. Spottiswoode
- Reply to May and Spottiswoode's on Experimenter Effect as the
Explanation for GCP Results
Roger Nelson
- Reply to May and Spottiswoode's The Global Consciousness Project:
Identifying the Source of Psi
Peter Bancel
Edwin C. May/
S. James P. Spottiswoode
- The Global Consciousness Project, Identifying the Source of Psi:
A Response to Nelson and Bancel
Neil Dagnell/Kenneth
Drinkwater/Andrew Parker
- Alien Visitation, Extra Terrestrial Life, and Paranormal Belief
- Anomalous Switching of the Bi Stable Percept of a Necker Cube:
A Preliminary Study
Dick J. Bierman
- Color Distribution of Light Balls in the Hessdalen Lights Phenomenon
Gerson S. Paiva/
Carlton A. Taft
- On Elephants and Matters Epistemological: Reply to Etzel Cardeas
Guest Editorial On Wolverines and Epistemological Totalitarianism
Neal Grossman
- Response to Neal Grossman's Reply On Elephants and Matters
Epistemological
Etzel Cardea
- Ernesto Bozzano: An Italian Spiritualist and Psychological Researcher
Luca Gasperini
- Obituary: In Memory of William Corliss
Patrick Huyghe
- Letter: Pipefish or Pipedream?
Ed L. Bousfield/Paul H. LeBlond
- 26:1 A Review of Sir William Crooke's Papers on Psychic Force with
Some Additional Remarks on Psychic Phenomena
Masayoshi Ishida
- The Implications of Near Death Experiences for Research into
the Survival of Consciousness
David Rousseau
Courtney Brown
- Remote Viewing the Future with a Tasking Temporal Outbender
Relativistic Variations in the Permittivity and Permeability of
Free Space = Gravitation
Graeme D. Montgomery
- Historical Perspective: The Psychic Sciences in France: Historical
Notes on the Annales des Science Psychiques
Carlos S. Alvarado
Renaud Evrard
- Obituary: Dr. Stuart Appelle: 1946-2011
Thomas E. Bullard
- Letter: Response to Bousfield and LeBlond: Shooting Pipefish
in a Barrel; or, Sauropterygian Mega Serpents and
Occam's Razor
Michael Woodley/
Cameron McCormick/
Darren Naish
- 26:2 A PK Experiment with Zebra Finches and a Virtual Predator
Revisiting the Alexander UFO Religious Crisis Survey (AUFORCS):
Is There Really a Crisis?
Fernando Alvarez
- Hallucinatory Telepathic Experiences Induced by Salvia divinorum
Hypnosis Reconsidered, Resituated, and Redefined
Jeff Levin
Grzegorz Juszcak
Adam Crabtree
- Commentary: A Proposal That Does Not Advance Our Understanding
of Hypnosis
Etzel Cardea/
Devin P. Terhune
- Commentary: Comments on Crabtree's Hypnosis Reconsidered,
Resituated, and Redefined
Charles T. Tart
- Commentary: Regarding Hypnosis Reconsidered, Resituated, and
Redefined: A Commentary on Crabtree
Don Beere
- Reply to Three Commenters on Hypnosis Reconsidered, Resituated,
and Redefined
Adam Crabtree
- Historical Perspective: The Sorcerer of Cobenzl and His Legacy: The Life
of Baron Karl Ludwig von Reichenbach, His Work and Its Aftermath
Michael Nahm
- Obituary: William Roll
Loyd Auerbach
- Letter to the Editor: Erroneous Expert Judgments
Henry H. Bauer

- 26:3 Earthquake Triggering: Verification of Insights Obtained by Intuitive Consensus William H. Kautz
 Audience Size Effects in Field RNG Experiments: The Case of Japanese Professional Baseball Games Takeshi Shimizu/
 Pranic Healing: Documenting Use, Expectations, and Perceived Benefits of a Little Known Therapy in the United States Maritza Jauregui/
 Tonya L. Schuster/
 Mary D. Clark/Joie P. Jones
 A New Approach to Veridicality in Dream Psi Studies Andrew Paquette
 Historical Perspective: Distortions of the Past Carlos S. Alvarado
 Essay: The Review Reviewed: Stop Publication Bias J. Alexander de Ru/John C.M.J. de Groot/
 Jan Willem M. Elshof
- 26:4 The Bell Inequality and Nonlocal Causality Charles W. Lear
 Magnetic Anomalies and the Paranormal John Ralphs
 NDE Implications from a Group of Spontaneous Long Distance Veridical OBEs Andrew Paquette
 Resonance between Birth Charts of Friends: The Development of a New Astrological Tool on the Basis of an Investigation into Astrological Synastry Gerhard Mayer/
 Martin Garms
 Historical Perspective: Notes on Early Mediumship Carlos S. Alvarado
 Essay: Seeking Immortality? Challenging the Drug Based Medical Paradigm. SSE Dinsdale Award Address Henry H. Bauer
 Letter to the Editor: Identity of Shakespeare James S. Ferris
- 27:1 Longitudinal Electromagnetic Waves? The Monstein Wesley Experiment Reconstructed Edward Butterworth/
 Charles B. Allison/
 Daniel Cavazos/Frank M. Mullen
 The UFO Abduction Syndrome Ted Davis/Don C. Donderi/Budd Hopkins
 Description of Benveniste's Experiments Using Quantum Like Probabilities Francis Beauvais
 Replication Attempt: Measuring Water Conductivity with Polarized Electrodes Serge Kernbach
 Commentary: The Influence of Reichenbach's Concept of Od Carlos S. Alvarado
 Obituary: Archie E. Roy Dies at 88 Tricia Robertson
 Letter to the Editor: Registering Parapsychological Experiments Caroline Watt
 Letter to the Editor: Magnetic Anomalies and the Paranormal Adrian Ryan
 Letter to the Editor: Response to Adrian Ryan John D. Ralphs
- 27:2 Use of a Torsion Pendulum Balance to Detect and Characterize What May Become a Human Energy Field J. Norman Hansen/
 Joshua A. Lieberman
 Geometry of an Intense Auroral Column as Recorded in Rock Art M. A. van der Sluijs/
 Robert J. Johnson
 David Deming
 Did Modern Humans Originate in the Americas? A Retrospective on the Holloman Gravel Pit in Oklahoma
 Experimental Birthmarks: New Cases of an Asian Practice Jim B. Tucker/H. H. Jr. Gen Keil
 Commentary: A Critical Response to David Lund's Argument for Postmortem Survival Michael Sudduth
 Obituary: Jack Houck (1939-2013) John Alexander
 Obituary: Ted Rockwell (1922-2013) John Alexander
- 27:3 Psi Effects or Sensory Leakage: Scrutinizing the Bell Selection Test Suitbert Ertel
 The Sheep/Goat Effect as a Matter of Compliance vs. Noncompliance: Lance Storm/
 The Effect of Reactance in a Forced Choice Ball Selection Test S. Ertel/Adam Rock
 Unidentified Aerial Phenomena (UAP): A New Hypothesis Toward The Explanation Daniel M. Gross
 Building Alien Worlds The Neuropsychology and Evolutionary Andrew R. Gallimore

- Implications of the Astonishing Psychoactive Effects of
N,N Dimethyltryptamine (DMT)
Historical Perspective: Three Stages of Modern Science Henry H. Bauer
- 27:4 Hum and Otoacoustic Emissions May Arise Out of the Same Mechanisms Franz G. Frosch
A Case of a Japanese Child with Past Life Memories Masayuki Ohkado
Unidentified Aerial Phenomena: The VASP 169 Flight Brazilian Episode
Revisited Luiz Augusto daSilva
Historical Perspective: Nineteenth Century Psychical Research in Mainstream Journals: The Revue Philosophique de la France et de l'Etranger Carlos s. Alvarado/
Renaud Evrard
- 28:1 Stock Market Prediction Using Associative Remote Viewing by Inexperienced Remote Viewers Christopher Carson Smith/
Darrell Laham/Garret Moddel
An Experimental Study for Reproduction of Biological Anomalies Reported in the Hoeven 1999 Crop Circle Robert J. Boerman/Jan Willem Bobbink
PreColumbian Transoceanic Influences: FarOut Fantasy, Unproven Possibility, or Undeniable Reality? Stephen C. Jett
G. Stanley Hall on Mystic or Borderline Phenomena Carlos S. Alvarado
Anomalistics, Pseudoscience, Junk Science, Denialism: Henry H. Bauer
Corollaries of the Role of Science in Society
Letter to the Editor: Exaggerated Emphasis Peter A. McCue
- 28:2 The Development and Phenomena of a Circle for Physical Mediumship Michael Nahm
Investigations of the Felix Experimental Group: 2011-2013 Stephen E. Braude
Commentary: On the Essay Review William Jackson Crawford on the Goligher Circle by Michael Tymn Michael Nahm
Commentary: On W. J. Crawford's Studies of Physical Mediumship Carlos S. Alvarado
Obituary: Halton Christian Chip Arp, 1927-2013 Peter A. Sturrock
- 28:3 Anomalous Retrocausal Effects on Performances in a Go/NoGo Task Dick J. Bierman/
Aron Bijl
An Investigation of Solar Features, Test Environment, and Gender Related to Consciousness Correlated Deviations in a Random Physical System Joey M. Caswell/
Lyndon M. Juden Kelly/
David A. E. Vares/Michael A. Persinger
Children with Life between Life Memories Ohkado Masayuki/Ikegawa Akira
Essay: Shamsans of Scientism: Conjuring Certainty Where There Is None Henry H. Bauer
Obituary: Eileen Coly (1916-2013) Carlos S. Alvarado/Nancy Zingrone
- 28:4 Psychological Evaluation of American Children Who Report Memories of Previous Lives Jim B. Tucker/
E. Don Nidiffer
Facial Features of Burmese with Past Life Memories as Japanese Soldiers Ohkado Masayuki
Parapsychological Phenomena as Examples of Generalized Nonlocal Correlations A Theoretical Framework Harald Walach/Walter
von Lucadou/Hartmann R. Mer
Aberrant Salience and Motivation as Factors in the Formation of Beliefs in Scientifically Unacceptable Phenomena Harvey J. Irwin
Historical Perspective: Does a Cosmic Ether Exist? Evidence from Dayton Miller and Others James DeMeo
Obituary: John O M. Bockris, 1923-2013 Edmund Storms
Review: Crimes of Reason by Stephen Braude Stan McDaniel
Review: Las Alas de Psique [The Wings of Psyche] by Alejandro Parra Carlos A. Alvarado
Review: The Spiritualist Movement edited by Christopher Moreman Alan Gauld
Review: One Mind by Larry Dossey Roger Nelson
Review: Bava's Gift by Michael Urheber Bob Ginsberg

- 29:1 Twitter Followers Biased to Astrological Charts of Celebrities Renay Oshop/Andrew Foss
 The Human Bioenergy Field Detected by a Torsion Pendulum? The Effect of Shielding and a Possible Conventional Explanation Willem H. van den Berg/
 William G. van der Sluys
 Commentary: Reply to van den Berg and van der Sluys: Effects Resembling a Biofield on a Torsion Pendulum Cannot Be Caused by the Subject John Norman Hansen/
 Joshua A. Lieberman
 Commentary: Response to Hansen and Lieberman Willem H. van den Berg/
 William G. van der Sluys
 Introduction to Honorton Article and Pilkington Interview with Parise Stephen E. Braude
 Commentary: A Moving Experience [reprinted from JASPR] Charles Honorton
 Commentary: Interview with Felicia Parise, August 6, 2013 Rosemarie Pilkington
 Historical Perspective: Note on an Early Physiological Index of ESP John Purdon's Observations of Synchronous Pulse Rates Carlos S. Alvarado
- 29:2 Modeling the Law of Times Julio Plaza del Olmo
 Can Solar Activity Influence the Occurrence of Economic Recessions? Mikhail Gorbanev
 A Correlation Study between Human Intention and the Output of a Binary Random Event Generator H. Grote
 Commentary on Does a Cosmic Ether Exist? Evidence from Dayton Miller and Others Robert D. Klauber
 Commentary: The Ether and Psychic Phenomena: Some Old Speculations Carlos S. Alvarado
 Commentary: The Importance of Retractions and the Need to Correct the Downstream Literature Jaime A. Teixeira da Silva
 Essay: Essay Review of The Survival Hypothesis Alan Gauld
- 29:3 Can Death Related Dreams Predict Future Deaths? Evidence from a Dream Journal Comprising Nearly 12,000 Dreams Andrew Paquette
 A Review on the Relation between Population Density and UFO Sightings Julio Plaza del Olmo
 Multivariate Entropy Analysis of Oxidative Stress Biomarkers Following Mobile Phone Exposure of Human Volunteers: A Pilot Study Anthony Marconi
 Albert Tasteyre/ Ren de S ze/Paul Fogel/Guy Simoneau/Marc Conti/Christian Sarbach/S. Stanley Young/Jean Emmanuel Gilbert/Yol ne Thomas
 Historical Perspective: Telepathic Emissions: Edwin J. Houston on Cerebral Radiation Carlos S. Alvarado
 Letter to the Editor: Quality in Parapsychological Meta Analyses Dick J. Bierman
- 29:4 Testing Telepathy in the Medium/Proxy Sitter Dyad: A Protocol Focusing on the Source of Psi Problem Adam J. Rock/
 Lance Storm
 Shortage of Rabbits or Insufficient Traps? Table Turning and the Discovery of a Presumably PKG ifted person in Argentina Juan Gimeno
 Essay: The Unbearable Fear of Psi: On Scientific Suppression in the 21st Century Etzel Cardea
 Appendix 1: Introduction to NonOrdinary Mental Expressions Etzel Cardea /
 Enrico Facco
 Essay Review: Climate Change Science or ClimateC hange Propaganda? Climate Change: Evidence & Causes An Overview from the Royal Society and the U.S. National Academy of Sciences Henry H. Bauer
 Commentary: Professor Bauer Has It Backwards Peter A. Bancel
 Commentary: Notes on the Essay Review of Climate Change: Evidence and Causes, by Henry Bauer Andrew Foss
 Commentary: Response to Commentaries by Peter Bancel and Andrew Foss Henry H. Bauer
 Letter to the Editor: Is Consensus in Science Good? Ron Westrum

- 30:1 Prospective Statistical Power: Sample Size Recommendations for the Investigation of the Main Parapsychological Phenomena William F. Krupke
 Consistency in Eyewitness Reports of Aquatic Monsters Charles G. M. Paxton & A. J. Shine
 Follow Up Investigations of the Felix Circle Stephen E. Braude
 Commentary: Further Comments about Kai M gge s Alleged Mediumship and Recent Developments Michael Nahm
 Historical Perspective: On Psychic Forces and Doubles: The Case of Albert de Rochas Carlos S. Alvarado
 Letter to the Editor: Physical Mediumship: Trying to Move On Zofia Weaver
 Letter to the Editor: A Recent Instance of Psi Censorship in Psychological Science? Gary E. Schwartz
 Obituary: Edgar D. Mitchell, 1930-2016 John Alexander
 Obituary: Richard (Dick) G. Shoup, 1943-2015 James Spottiswoode
- 30:2 Sonic Analysis of the Redlands UFO Tape Recording Patrizio Tressoldi
 The Rarity of Unambiguous Symbols in Dreams: A Case Study Andrew Paquette
 An Experiment on Precognition with Planarian Worms Fernando Alvarez
 Commentary: On Marc Thury s Les Tables Tournantes Carlos S. Alvarado
 Historical Perspective: Revealing the Real Madame d Esperance: An Historical and Psychological Investigation Adrian Parker
 Elisabeth Warwood
- 30:3 Use of a Torsion Pendulum Balance to Detect and Characterize What May Be a Human Bioenergy Field Joshua A. Lieberman
 Geometry of an Intense Auroral Column as Recorded in Rck Art Marinus Anthony van der Sluijs
 Robert J. Johnson
 Did Modern Humans Originate in the Americas? A Retrospective on the Holloman Gravel Pit in Oklahoma David Deming
 Experimental Birthmarks: New Cases of an Asian Practice Jim Tucker/H. H. J rgen Keil
 Commentary: A Critical Response to David Lund s Argument for Postmortem Survival Michael Sudduth
 An Historical and Psychological Investigation Elisabeth Warwood
 Obituary: Jack Houck (1939-2013) John Alexander
 Obituary: Ted Rockwell (1922-2013) John Alexander
- 30:4 Strange Handprints in Strange Places Allison Zumwalde/Kendall Ciriaco/John Allison
 A Same Family Case of the Reincarnation Type in Japan Ohkado Masayuki
 Apport Phenomena of Medium Herbert Baumann (1911-1998): Report on Personal Experiences Illobrand von Ludwigier/
 Michael Nahm
- 31:1 Anomalous/Paranormal Experiences Reported by Nurses in Relation to Their Patients in Hospitals Alejandro Parra/
 Paola Gim nez Amarilla
 On the Resurrection of Trans Temporal Inhibition Charles Tart
 New Paradigm Research in Medicine: An Agenda Jeff Levin
 Anomalous Phenomena and the Scientific Mind: Some Insights from Psychologist Louis Favre (1868-1938?) Renaud Evrard
 The Challenge of Ball Lightning: Evidence of a Parallel Dimension ? Peter Sturrock
- 31:2 Laboratory Research on a Presumably PK Gifted Subject Juan Gimeno/Dario Burgo
 A Question of Belief: An Analysis of Item Content in Paranormal Questionnaires Lance Storm/Ken Drinkwater/
 Anthony L. Jinks
 Multiple Analysis Correlation Study between Human Psychological Variables and Binary Random Events Hartmut Grote
 Telepathy, Mediumship, and Psychology: Psychological Research at the

- International Congresses of Psychology, 1889-1905 Carlos S. Alvarado
- 31:3 Statistical Parapsychology as Seen by an Applied Physicist Wolfgang Helfrich
Eisenbud, Smias, and Psi Jason Kissner
The Mediumship of Carlos Mirabelli (1889-1951) Stephen E. Braude
Telepathy, Mediumship, and Psychology: Psychical Research at the
Selected Aspects of Carlos Mirabelli's Mediumship Michael Nahm
- 31:4 Same Family Cases of the Reincarnation Type in Japan Ohkado Masayuki
A Test of an Occult Theme Seance: Examining Anomalous Events, Brian Laythe/
Psychosomatic Symptoms, Transliminality, and Elizabeth Cooper Laythe/
Electromagnetic Fields Lucinda Woodward
- Historical Perspective: William Shakespeare: A Study of the Poet and
Five Famous Contemporaries Who Between Them Used the
Rune Ciphers to Reveal His True Identity David L. Roper
- Essay: Shakespeare: The Authorship Question, A Bayesian Approach
[reprinted from a 2008 JSE article] Peter A. Sturrock
- Obituary: Yvonne Duplessis, 1912-2017 Renaud Evrard
- 32:1 On Carving Reality at Its Joints: Black Holes and Process, People,
and an Experimental Challenge Chris Nunn
An Ethnographic Assessment of Project Firefly: A Yearlong Endeavor
to Create Wealth by Predicting FOREX Currency Moves with Debra Katz/
Associative Remote Viewing Igor Grgić/
T. W. Fendley
- Historical Perspective: Fragments of a Life in Psychical Research: The
Case of Charles Richet Carlos S. Alvarado
- Historical Perspective: Mediumistic Phenomena Part I by Julian
Ochorowicz translated by Casimir Bernard and Zofia Weaver Zofia Weaver
- Essay: Toward a Science of the Subjective: Reminiscences and
Speculations in Memory and in Honor of Bob Jahn Henry H. Bauer
Essay: A Tribute to Bob Jahn York Dobyns
Essay: Lab Coat and Turban, a Tribute to Robert G. Jahn Roger D. Nelson
Essay: Remembrance of Bob Jahn Tony Edwards
Essay: A Personal Tribute to Bob Jahn William Bengston
- 32:2 Observer Effects on Quantum Randomness: Testing Micro Markus A. Maier/
Psychokinetic Effects of Smokers on Addiction Related Stimuli Moritz C. Deschamps
A Study on Reported Contact with Non-Human Intelligence Reinerio Hernandez/Robert Davis
Associated with Unidentified Aerial Phenomena Russell Scalpone/Rudolph Schild
- Historical Perspective: Mediumistic Phenomena Part II by Julian Casimir Bernard/
Ochorowicz, translated by Casimir Bernard and Zofia Weaver Zofia Weaver
- Obituary: Bob Jahn: Co-Founder of SSE Peter A. Sturrock
- 32:3 The Effects of Geophysical Anomalies on Biology Lydia Giannoulou/ Angelos Evangelou
Spyros Karkabounas/Stavros Papamarinopoulos
- A Methodology Proposal for Conducting a Macro-PK Test on Eric Dullin/
Light-Spinning Objects in a Non-Confined Environment David Jamet
- Prediction of Mental Illness Using Indian Astrology: Rajeshkrishna Panambur Bhandary/
Cross-Sectional Findings from a Prospective Study Podila Satya Venkata/
from a Prospective Study Narashimha Sharma/Hema Tharoor
- Commentary: Investigating Physical Mediums via
Audio Signal Processing: A Comment on a Recent Approach Michael Nahm
Ochorowicz, translated by Casimir Bernard and Zofia Weaver Zofia Weaver
- Historical Perspective: Note on the Intellectual Work of
William Stainton Moses Carlos S. Alvarado
- Obituary: Tribute to Guy Lyon Playfair (1935-2018) Alan Murdie

- 32:4 Experimenter Psi Effect in Precognition Tests with Planarians
A Methodology Proposal for Conducting a Macro PK Test on
LightS pinning Objects in a NonC onfined Environment
Human Mental Intentionality on the Aesthetics of Cooked Rice
and Escherichia coli Growth
Fernando Alvarez
Eric Dullin/
David Jamet
Alan W. L. Lai/
Bonny B. H. Yuen/
Richard Burchett
- Brief Research: A Follo Up Study on Unusual Perceptual Experiences
in Hospital Settings Related by Nurses
Alejandro Parra
Henry H. Bauer
- Commentary: Experimental Replicability
Historical Perspective: Table Turning in the Early 1850s:
The S ance Reports of Ag nor de Gasparin
Carlos S. Alvarado
Letter to the Editor: JSE Tributes to Bob Jahn
Brenda J. Dunne
- 33:1 Coincidence or Psi? The Epistemic Import of Spontaneous Cases
of Purported Psi Identified Post Verification
Sharon Hewitt Rawlette
Two Attempted Retro Priming Replications Show Theory Relevant
Anomalous Connectivity
Jacob Jolij
Dick Bierman
Review: The Case for Advance Wave Causality
Charles W. Lear
Historical Perspective: Musings on Materializations: Eric J. Dingwall
on The Plasma Theory
Carlos S. Alvarado
Letter to the Editor: Preparing for the Death of a Loved one
Robert Ginsberg
- 33:2 Imagination and Reactance in a Psi Task Using the Imagery Cultivation
Model and a Fuzzy Set Encoded Target Pool
Lance Storm
Homeopathy and the Action of Meaning: A Theoretical Approach
Walter v. Lucadou
A Camera Based Tracking System for Ouija Research
Eckard Kruse
- 33:3 Editorial: Why Do Ghosts Wear Clothes?
Stephen E. Braude
Guest Editorial: On the Potential Role of Psi in an Expanded Science
of the Physical, Experientail, and Spiritual
Charles T. Tart
How Smokers Change Their World and How the World Responds:
Testing the Oscillatory Nature of Micro Psychokinetic Observer
Moritz D. Dechamps
Effects on AddictionR elated Stimuli
Markus A. Maier
A Multi Frequency Replicaton of the MegaREG Experiments
Keith Alexandr
The Location and Reconstruction of a Byzantine Structure in Marea,
Egypt, Including a Comparison of Electronic Remote Sensing
and Remote Viewing
Stephan A. Schwartz
- 33:4 Imagination and Reactance in a Psi Task Using the Imagery Cultivation
Model and a Fuzzy Set Encoded Target Pool
Lance Storm
Homeopathy and the Action of Meaning: A Theoretical Approach
Walter v. Lucadou
A Camera Based Tracking System for Ouija Research
Eckard Kruse
- 34:1 Editorial: Cosmic Aesthetics
Stephen E. Braude
Development and Deployment of the Windbridge Psi and Related
Phenomena Awareness Questionnaire (WPRPAQ)
Julie Beischel
Mark Bocuzzi
The Discovery of an American Brig: Fieldwork Involving Applied
Remote Viewing Including a Comparison with Electronic
Stephan A. Schwartz
Remote Sensing
Randall J. De Mattei
Essay: Loch Ness Monsters as Cryptid (Presently Unknown)
Sea Turtles
Henry H. Bauer
Letter to the Editor: Time to Celebrate!
Michael Nahm
Essay Review: Disappointing Documentary about Loch Ness Monsters
(Nessies): (Can Good Documentaries Be Made about Such
Subjects?) **Loch Ness Monster New Evidence** by Travel Channel
Henry H. Bauer

- Essay Review: Phone Calls from the Dead? Exploring the Role of the Trickster. **Des coups de fil de l'AU-DELÀ? Enquête sur un phénomène paranormal incroyable: Sa folie, ses caractéristiques et son explication** by Laurent Kasprowicz
- 34:2 Editorial: Does Telepathy Threaten Mental Privacy?
A New Model to Explain the Alignment of Certain Ancient Sites
Mind Control of a Distant Electronic Device: A Proof of Concept
Pre Registered Study
- The Global Consciousness Project's Event Related Responses Look Like Brain EEG Event Related Potentials
- Behind the Mask: An Analysis of the Dedication of Shakespeare's Sonnets and Its Implications for the Authorship Question
- Commentary: New Life for Cold Fusion
- Essay Review: **The Star Gate Archives, Volumes 1-4, Reports of the U.S. Government Sponsored Psi Program 1972-1995** edited by Edwin C. May and Sonali Bhatt Marwaha
- Essay Review: Scientocracy: Why a Science Court is Needed
Scientocracy: The Tangled Web of Public Science and Public Policy edited by Patrick J. Michaels and Terence Kealey
- Sharon Hewitt Rawlette
Stephen E. Braude
Mark J. Carlotto
Patrizio Tressoldi
Luciano Pederozoli,
Elena Pratti
Luca Semenzato
- Roger G. Nelson
Peter A. Sturrock
Kathleen E. Erickson
Henry H. Bauer
- Damien Broderick
- Henry H. Bauer



SOCIETY FOR
SCIENTIFIC EXPLORATION

GIFT JSE ISSUES & SSE MEMBERSHIPS, BACK ISSUES

Single Issue: A single copy of this issue can be purchased.
For back issues from 2010 to present in print, contact
membership@scientificexploration.org

Price: \$20.00 EACH

Online Access: All issues and articles from Volume 1 to present can be
read for free at <https://www.scientificexploration.org/journal-library>

Subscription: To send a gift subscription, fill out the form below.

Price: \$85 (online)/\$145(print & online) for an individual
\$165/\$225 (online only/print) for library/institution/business

Gift Recipient Name _____

Gift Recipient Address _____

Email Address of Recipient for publications _____

- I wish to purchase a single copy of the current JSE issue.
- I wish to remain anonymous to the gift recipient.
- I wish to give a gift subscription to a library chosen by SSE.
- I wish to give myself a subscription.
- I wish to join SSE as an Associate Member for \$85/yr or \$145/yr
(print), and receive this
quarterly journal (plus the EdgeScience magazine and The Explorer
newsletter).

Your Name _____

Your Address _____

Send this form to: Journal of Scientific Exploration
Society for Scientific Exploration
P. O. Box 8012
Princeton, NJ 08543-8012

Membership@ScientificExploration.org
Phone (1) (609) 349-8059

For more information about the Journal and the Society, go to
<https://www.scientificexploration.org>



SOCIETY FOR SCIENTIFIC EXPLORATION

JOIN THE SOCIETY AS A MEMBER

Join online at <https://www.scientificexploration.org/join>

The Society for Scientific Exploration has four member types:

Associate Member (\$85/year with online Journal; \$145 includes print Journal): Anyone who supports the goals of the Society is welcome. No application material is required.

Student Member (\$40/year includes online Journal; \$100/year includes print Journal):

Send proof of enrollment in an accredited educational institution.

Full Member (\$125/year for online Journal; \$185/year includes Print Journal): Full Members may vote in SSE elections, hold office in SSE, and present papers at annual conferences. Full Members are scientists or other scholars who have an established reputation in their field of study. Most Full Members have: a) doctoral degree or equivalent; b) appointment at a university, college, or other research institution; and c) a record of publication in the traditional scholarly literature. Application material required: 1) Your curriculum vitae; 2) Bibliography of your publications; 2) Supporting statement by a Full SSE member; or the name of Full SSE member we may contact for support of your application. Send application materials to SSE Secretary Mark Urban-Lurain, scientificexplorationsecretary@gmail.com

Emeritus Member (\$85/year with online Journal; \$145/year includes print Journal): Full Members who are now retired persons may apply for Emeritus Status. Please send birth year, retirement year, and institution/company retired from.

All SSE members receive: online quarterly *Journal of Scientific Exploration (JSE)*, *EdgeScience* online magazine, *The Explorer* online newsletter, notices of conferences, access to SSE online services, searchable recent *Journal* articles from 2008 current on the JSE site by member password, and for all 25 years of previous articles on the SSE site. For additional new benefits, see World Institute for Scientific Exploration, instituteforscientificexploration.org

Your Name _____

Email _____

Phone _____ Fax _____

Payment of _____ enclosed, or

Charge My VISA Mastercard

Card Number _____ Expiration _____

Send this form to:

Society for Scientific Exploration
P. O. Box 8012
Princeton, NJ 08543-8012
Membership@ScientificExploration.org
Phone (1) (609) 349-8059

For more information about the Journal and the Society, go to <https://www.scientificexploration.org>



JOURNAL OF SCIENTIFIC EXPLORATION

A Publication of the Society for Scientific Exploration

Instructions for Authors (Revised October 2018)

JSE is an open access journal, with a CC-BY-NC license. There are no submission fees, no reader fees, no author page charges, and no open access fees. Please submit all manuscripts at <http://journalofscientificexploration.org/index.php/jse/login> (please note that "www" is NOT used in this address). This website provides directions for author registration and online submission of manuscripts. Full Author Instructions are posted on the Society for Scientific Exploration's website at https://www.scientificexploration.org/documents/instructions_for_authors.pdf for submission of items for publication in the *Journal of Scientific Exploration* (including "Writing the Empirical Journal Article." Before you submit a paper, please familiarize yourself with the *Journal* by reading JSE articles. Back issues can be read at <https://www.scientificexploration.org/journal-library>, scroll down to the Open Access issues. Electronic files of text, tables, and figures at resolution of a minimum of 300 dpi (TIF or PDF preferred) will be required for online submission. You will also need to attest to a statement online that the article has not been previously published and is not submitted elsewhere. The journal uses the *APA Publication Manual 7th edition* as its style guide.

JSE Managing Editor: Journal@ScientificExploration.org

AIMS AND SCOPE: The *Journal of Scientific Exploration* publishes material consistent with the Society's mission: to provide a professional forum for critical discussion of topics that are for various reasons ignored or studied inadequately within mainstream science, and to promote improved understanding of social and intellectual factors that limit the scope of scientific inquiry. Topics of interest cover a wide spectrum, ranging from apparent anomalies in well-established disciplines to rogue phenomena that seem to belong to no established discipline, as well as philosophical issues about the connections among disciplines. The *Journal* publishes research articles, review articles, essays, book reviews, and letters or commentaries pertaining to previously published material.

REFEREEING: Manuscripts will be sent to one or more referees at the discretion of the Editor-in-Chief. Reviewers are given the option of providing an anonymous report or a signed report.

In established disciplines, concordance with accepted disciplinary paradigms is the chief guide in evaluating material for scholarly publication. On many of the matters of interest to the Society for Scientific Exploration, however, consensus does not prevail. Therefore the *Journal of Scientific Exploration* necessarily publishes claimed observations and proffered explanations that will seem more speculative or less plausible than those appearing in some mainstream disciplinary journals. Nevertheless, those observations and explanations must conform to rigorous standards of observational techniques and logical argument.

If publication is deemed warranted but there remain points of disagreement between authors and referee(s), the reviewer(s) may be given the option of having their opinion(s) published along with the article, subject to the Editor-in-Chief's judgment as to length, wording, and the like. The publication of such critical reviews is intended to encourage debate and discussion of controversial issues, since such debate and discussion offer the only path toward eventual resolution and consensus.

LETTERS TO THE EDITOR intended for publication should be clearly identified as such. They should be directed strictly to the point at issue, as concisely as possible, and will be published, possibly in edited form, at the discretion of the Editor-in-Chief.

PROOFS AND AUTHOR COPIES: Authors will receive copyedited, typeset page proofs for review. Print copies of the published *Journal* will be sent to all named authors if requested.

COPYRIGHT: Authors retain copyright to their writings. However, when an article has been submitted to the *Journal of Scientific Exploration* for consideration, the *Journal* holds first serial (periodical) publication rights. Additionally, after acceptance and publication, the Society has the right to post the article on the Internet and to make it available via electronic as well as print subscription. The material must not appear anywhere else (including on an Internet website) until it has been published by the *Journal* (or rejected for publication). After publication in the *Journal*, authors may use the material as they wish but should make appropriate reference to the prior publication in the *Journal*. For example: "Reprinted from [or From] "[title of article]", *Journal of Scientific Exploration*, vol. [xx], no. [xx], pp. [xx], published by the Society for Scientific Exploration, <http://www.scientificexploration.org>."

DISCLAIMER: While every effort is made by the Publisher, Editors, and Editorial Board to see that no inaccurate or misleading data, opinion, or statement appears in this *Journal*, they wish to point out that the data and opinions appearing in the articles and announcements herein are the sole responsibility of the contributor concerned. The Publisher, Editors, Editorial Board, and their respective employees, officers, and agents accept no responsibility or liability for the consequences of any such inaccurate or misleading data, opinion, or statement.