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EDITORIAL

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When I first dipped my toe tentatively into the frigid waters of psi research, back in the late 1970s, one of the big issues of the time was whether the ability to replicate experiments distinguishes—or as philosophers often say, *demarcates*—science from non-science (or pseudoscience). This was a big issue because all too often parapsychological skeptics glibly used that demarcation criterion to bludgeon psi researchers and dismiss them as unscientific. Fortunately, in those days there was some very sensible writing on the subject, particularly from Harry Collins, to whom I was especially indebted when I tackled the topic of replicability myself for the first time.[1] The skeptical position on the issue of repeatability struck me as so lame that I even naïvely expected the debate to be settled rather quickly.

However, because psi researchers often enter the field having little acquaintance with the work that preceded them, and because many critics of that research likewise fail to master the relevant issues, I suppose I shouldn't be surprised that the debate over the nature and importance of replicability still rages. Indeed, little (if any) attention is given to the reasonable points that should have put that issue to rest long ago. Instead, researchers and commentators focus relentlessly—and as usual, inconclusively—on the results of meta-analyses. Some of those meta-analyses are indeed worthy of attention,[2] but (I would say) only in light of the overlooked considerations I discuss below.

So I'd like to review some problems with the still-widely–held view that the ability to replicate experiments is what demarcates science from non-science or pseudoscience.[3] As I see it, that position is both shallow and confused, and the problems with it don't even have the virtue of being subtle. First, the skeptical reliance on the demarcation criterion rests on a naïve conception of the actual importance within science of experimental repeatability. Indeed, experimental repeatability plays little if any role in disciplines (including some physical sciences) whose scientific credentials are not in dispute. Second, it seriously misconstrues how the appeal to replicability works even in those physical sciences where it plays a real role. Third, the received view rests on philosophical confusions regarding the nature of similarity—in particular, the flawed idea that there can be formal, context-independent, criteria for the similarity of two things. And fourth, it rests on confusions over the nature of human abilities generally, and in

particular, the appropriate methodologies for studying them. One could also argue that a fifth problem for this received view is that psi research can in fact point to replicable results. But that last issue must be reserved for another occasion.

The Real Role of Replication in Science

It's clear enough why some people place great emphasis on the replication of experiments, both in parapsychology and in orthodox science. The familiar, underlying idea is that if an experiment E gives a result which replication attempts are unable to reproduce, we have reason to regard E's result as scientifically dubious. And if continued attempts to replicate E fail to duplicate E's result, we have, it would seem, prima facie evidence for taking that result to be due to a flaw in E's experimental design, or to experimenter negligence or incompetence, or perhaps even to chicanery. As a rule, then, only experiments whose results can be repeated are considered genuine and reliable. This, clearly, is why some consider experimental repeatability to be a demarcation criterion between science and non-science.

So let's consider first the respects in which the received view's underlying conception of repeatability is naïve. The replicability criterion is obviously borrowed from the physical sciences—but only from some of them (primarily, physics and chemistry). However, experimental repeatability has very little utility in other physical sciences of impeccable credentials—for example, geology and astronomy. Moreover, the received view seriously misconstrues how the appeal to replicability works even in those physical sciences where it plays a major role.

To see this, consider first the abstract question: In what respect(s) can we allow replication attempt E2 to differ from an original experiment E1 and still consider it to be a replication attempt?[4] Obviously, the two experiments can't be alike in *all* respects; they would then be identical, not different experiments. Clearly, E1 and E2 will at least differ with respect to time and/or place of the experiments.

But of course, many other changes will accompany the changes in time and place. These will likely include, for example, differences in the experimental conditions or environment (including inevitable subtle changes in the experimental apparatus required—especially sophisticated, sensitive, and delicate equipment that may continually require fine-tuning), or changes in the actual participants (or just their state of mind). All of these may vary subtly or dramatically from one test to another. But this means that *some* changes between E1 and E2 *must* be tolerated.

But in that case, how is one supposed to determine, *before the results are in*, which differences (if any) matter? What is seldom observed (except

by Harry Collins) is that in *every* science in which experimentation plays a role, it is standard practice to tolerate many differences between original experiments and replication attempts. But that means that scientists in these domains are working with a very loose conception of replication. In fact, scientists who rely on replication attempts don't—and can't—decide, until the results are in, whether the inevitable differences between experiments matter. But that means they can't specify, in advance of conducting a replication attempt, a reliable, much less formal, recipe for replicating the original experiment. Let's look at this in more detail.

Consider first how these observations are true even in the so-called "hard" sciences. In physics, for example, an experiment conducted at laboratory L1 with a certain kind of particle accelerator might be replicated at laboratory L2 with a different design of accelerator. In microbiology, experiments conducted with microorganism M1 in solution S1 might be replicated by studying M1 in a different solution S2 (which may have been more convenient to use, but whose differences are regarded as not making a difference). In fact, even a different microorganism M2 might have been substituted and its difference discounted. And of course, despite the expectations (or at least the hopes) of the replicating scientist, it's always possible that such differences between experiments lead to differences in experimental outcome.

One thing this means is that, *as good science is actually practiced*, the concepts of *similarity of design*, *agreement of results*, or *same result* are both loose and elastic. (We'll return to this point when considering the nature of similarity.) For now, the important point is that the inevitable differences between experiments E1 and E2 will be ignored if their results agree, whereas those same differences might be deemed both relevant and critical if the different experiments yield relevantly different results. But that means *it's not decided in advance—on purely formal grounds—whether the inevitable differences in E1 and E2 matter*. If E2 gets unexpected or undesired results, only then might scientists consider that they were wrong in assuming that the differences didn't matter. But in that case, if E2's results are considered different from those of E1, scientists could easily conclude that E2 wasn't the same experiment as E1, rather than a failed replication. Thus *it can be unclear what the difference is between a failed replication and a different experiment*.

Of course in that case, since differences between E1 and E2 can't be avoided and may lead to a difference in outcome for two experiments, the failure of E2 to achieve the same results as E1 doesn't automatically discredit or even cast serious doubt on E1. Granted, the situation changes somewhat when a series of replication attempts fails to produce the results

of the original experiment. But since all those experiments will likewise differ from each other, it's hardly a straightforward matter to tease out what's responsible for what.

Now in parapsychology, where differences in participants (or their state of mind) may be considerable, and where (thanks to the source of psi problem) we can't be sure who might be influencing experimental outcomes (e.g., the "official" subject, experimenter, onlooker, analyzer), the notions of "same experiment" and "same result" seem especially unclear. But even if we ignore source-of-psi complications, psi research demonstrates the same sort of loose conception of repeatability found in the physical sciences. In parapsychology, E2 may differ from E1 with respect to (for example) the method of stimulating or eliciting a subject's response, providing a subject with feedback, evaluating subjects' responses, the type of interaction permitted between experimenter and subject (including the words spoken and the inflection of those words), and even in the type of response required of the subject.

But this is at most just a difference in degree—not a difference in kind—from what we find in non-behavioral sciences. It certainly doesn't justify the claim that parapsychology is a non-science, or that it's a pseudoscience, or that parapsychology has no repeatable experiments. Methodologically speaking, experimental psi research operates with the same loose conception of repeatability we find in physics, chemistry, and microbiology. And in none of these cases must this reveal a defect in the way the science is practiced. Rather, it's a simple consequence of the inevitable differences between any experiment E1 and any attempted replication E2.

Philosophical Problems with the Received View

To lend a somewhat broader perspective to this discussion, we should also observe that some difficulties in determining when an experiment has been repeated are not peculiar to the scientific enterprise or to the process of experimentation. Rather, they're instances of the more general problem of determining when any sort of event has been repeated. These problems, in other words, concern the general concept of *recurrence*, and even more fundamentally, the concept of *similarity*.

Thus, the question "When does E2 replicate E1?" is at bottom a question about when two experiments count as similar. But the concept of similarity is irreducibly context-dependent. That is, things are not inherently either similar or dissimilar. They must count or be taken as similar or dissimilar relative to some context of inquiry and criteria of relevance. And since no context of inquiry is inherently privileged, that means there's no privileged answer to questions of the form: Is *A* similar to *B*?

Consider for example: Are the movements of an elephant similar to those of a flea? Clearly, there's no privileged correct answer to that question. Sometimes size matters, and sometimes it doesn't. Similarly, does a young beginner's golf swing contain the same movements as the swing of Tiger Woods? Again, there's no privileged correct answer. We might say "yes" if we're comparing golf swings to tennis swings, but not when the focus is on fine differences between the techniques of different golfers. And neither of those perspectives enjoys inherent priority over the other.

Or suppose I try to tell the same joke I heard someone tell the day before. Is the joke I told similar or not to the one I heard earlier? Obviously, it depends on what's relevant to our answering that question, and no criteria of relevance are inherently privileged over the others. Depending on the situation, we might focus on whether my joke made the audience laugh, or whether the words were exactly the same, or delivered at the same speed, or with the same accent or timing, or with the same inflection, or whether my voice had the same timbre as that of my predecessor. The point should be clear: Similarity is not a *static* two-term relation obtaining inherently between the things taken to be similar. Rather, similarity exists *only* with respect to variable and shifting criteria of relevance. It can only be a *dynamic* relation holding between things at a time and within a context of needs and interests.[5]

Likewise, in scientific experimentation, whether E2 replicates E1 is not strictly a function of the formal, much less antecedently specifiable, features of the two experiments. We've already observed that replication attempts will inevitably differ in some respects from the original experiment. But we also noted that in the ordinary course of the established sciences, some of these differences—for example, the mental states of the experimenters, and differences in the equipment used—tend to be discounted when a replication attempt is deemed successful. However, in parapsychology the very same sorts of differences are regarded as potentially relevant to the experimental outcome, although even in parapsychology such differences might also be discounted when replication attempts are deemed successful.

It's also worth noting that there are further complications in deciding what counts as the *same result*. For example, one can raise legitimate questions about what counts as an appropriate level of significance from mean chance expectation. And in parapsychology, a familiar nagging issue is whether extra-chance *negative* results (psi-missing) can be allowed to replicate positive scoring in an earlier experiment. These complications reinforce the points already made about the loose way in which the concept of replication is inevitably used in science, and they needn't be considered in more detail here.[6]

Human Abilities

Because psi experiments presumably study ostensible abilities of their subjects, it obviously matters what sort of endowment psi might be, and whether the methodologies used to study it are appropriate to those endowments. But then, it's important to note some relevant, but typically unheralded, matters regarding human abilities.[7]

The first point to note is that the notion of a human ability (like the concept of replication) is extremely loose and elastic, covering an enormously wide terrain. In one appropriate and also very common use of the term, "ability" can stand for rudimentary and more or less universal human (or organic) endowments. For example, we can speak of someone's ability to laugh, experience fear, express aggression or compassion, or merely breathe, blink, or move the muscles in one's arm. In this sense of the term, an ability needn't be any kind of proficiency or skill, or disposition to exhibit such a proficiency.

But the term "ability" can also denote various degrees of competence or mastery—for example, when we speak of a person's ability, to learn a new language, carry a tune, hammer a nail, or control pain through self-hypnosis. And of course it can also denote competencies requiring great mastery, as in the ability to play professional-level tennis, write a string quartet, dock a space capsule, read an orchestral score, or solve quadratic equations. "Ability" in this sense seems nearly synonymous with what we usually mean by "skill."

But if we're to have a nuanced, general account of human abilities, we must also consider some other endowments, likewise unevenly distributed among humans, but which we would probably not want to label as skills. Consider, for example, the ability to fire an employee, express sensuality, speak in front of an audience, inspire loyalty in others, remain hopeful in the face of adversity, manipulate others through guilt, and laugh at oneself.

A moment's reflection on the examples above should make it clear that the term "ability," like most ordinary language expressions, has no single and preferred—much less clear and unambiguous—meaning. That's one reason why there's no interesting set of properties shared by all the things we consider abilities, and which distinguish abilities from non-abilities.

At best, the different senses of "ability" merely identify useful points on a continuum of human endowments (ordered roughly in terms of complexity and refinement). And the reason this matters is that it reveals why laboratory research in parapsychology is almost ludicrously premature. It highlights the fact that researchers have no idea what kind of organic function they're trying to investigate. Not only are we ignorant of psi's

finer-grained features, we don't even know what its natural history might be—for example, whether it has an evolutionary role or primary or overall purpose or function (although there is no shortage of speculation on these matters[8]).

Of course, there's no reason to think that psychic phenomena occur only for parapsychologists, much less only when those parapsychologists set out to look for them. After all, a major motivation for conducting formal studies is that we have evidence of psi occurring spontaneously in life. But since we're a very long way from understanding the nature and function of everyday psi, we don't know whether psychic functioning resembles musical or athletic abilities in its variability, or whether it's a brute endowment such as the capacity to see or to move one's limbs. Obviously, then, in the absence of this rudimentary knowledge, we have no idea whether (or to what extent) our experimental procedures are even appropriate to the phenomena.

To see this, compare our knowledge and study of psi with our knowledge and study of memory. Memory is something we *can* study formally to some extent. But we have some idea how to proceed because we're already very familiar with the many and diverse manifestations of memory in daily life. Or compare our knowledge of psi with our knowledge of the ability to be witty. It's because we're familiar with the latter that we know we *can't* adequately study it experimentally. Or again, a tennis player's ability to return serves is something that—unlike everyday psi—we can systematically and easily examine in real-life, relevant settings. In fact, we can study that ability pretty much on demand, and from virtually anyone who claims to have the ability.

It should be obvious, then, that different abilities, as a rule, demand different modes of investigation. We wouldn't examine mechanical aptitude the same way we investigate the ability to produce witty remarks, the ability to baby-sit, the ability to design and install a patio, the ability to learn a new language, the ability to empathize, or the skill of playing football wide-receiver or soccer goal-keeper. Similarly, techniques appropriate to studying those abilities will differ from those suitable for examining rudimentary endowments, such as the capacity to blink, swallow, utter sounds, or dream.

Furthermore, for most human abilities, it's hard to pin down what, exactly, we need to look at. Consider, for example, the ability to compose music. Clearly, that ability can be expressed in many ways. Many composers notate their compositions; others lack that ability. Some composers have absolute pitch, some only relative pitch, and some neither. Some compose directly onto paper, while others need a piano or some other instrument. Some work best with large forms; others don't. Some write especially well or idiomatically only for certain instruments; others don't have that limitation.

Some have a keen ability to set words to music; others lack that sub-ability. Some are especially adept at harmony, rhythm, or instrumental color, and those specialties likewise take different forms and manifest in different degrees and combinations. But then there should be little temptation to think that compositional ability allows many useful generalizations. And there's no reason to think this case is unique; the same is obviously true, for example, in the case of athletic ability, or comedic ability.

What we do know is that people who possess a general ability may exhibit it in various ways and to varying degrees. The differences have to do with the subsidiary abilities or skills they possess and the manner in which they possess them. The moral here should be obvious: At our current level of ignorance, we're in no position to say that psychic functioning is an exception to this rule.

In fact, one can argue plausibly that the manifestation of psi is as deeply idiosyncratic and variable as any other ability. Psi-conducive conditions may be as personal and individual as the conditions people find amusing, or erotic. Most subjects don't do their best under intense pressure or when the stakes are high (say, during a live television demonstration), but a few excel under those conditions and even relish the challenge. And some may be able to demonstrate psi only in the presence of select others—for example, investigators they find especially supportive or agreeable, just as most people can sing or express sensuality only in the presence of those with whom they feel personally safe. Second, the subjective experience of exercising psi varies widely—for example, whether ESP is accompanied by vivid, familiar, or any imagery. And third, the range and specificity of the ability may also vary idiosyncratically. For example, one might be good at psychokinetically influencing small objects but not at affecting random event generators in computerized experiments. Or, one might be good at remote-viewing shapes but not technical details, or colors but not smells, or medium-sized objects but not words on paper (Pat Price, notoriously, was distinctively [if not uniquely] good at this latter task). In fact, this type of ESP variability would parallel a familiar feature of more ordinary perceptual differences. Some are particularly good at (say) discriminating colors but not sounds, detecting subtle differences in wines or chocolates but not in audio components, or noticing eye color but not manipulative behavior.

Moreover, many (and perhaps all) abilities are highly context-dependent and can be expressed or studied properly *only* under quite specific conditions. For example, we can evaluate a tennis player's ability to return serves only under physically and psychologically challenging game conditions. Similarly, a pianist's ability to play the "Waldstein" Sonata, or a comedian's ability to be funny, varies with confidence level,

audience attitude, personal distractions, and so on. So if psychic functioning is analogous to these sorts of organic endowments (as many think and as both experimental evidence and anecdotal reports suggest), then we'd be entitled to say that not everyone is psychic, that some are more psychic than others (enough so to count as "stars" or as gifted), and that not all psychics are psychic in the same way. Needless to say, this can only complicate the process of replicating experiments, both across different subjects, and even with a single subject.

But what if psychic functioning is analogous to elementary capacities? In that case, psi might be as uniformly distributed among humans as pulmonary or reproductive functioning, or as reflexive and involuntary as nursing behavior or fear responses. Moreover, although some lack these familiar capacities or possess them only in attenuated forms, most people have no such limitations. Analogously, the capacity to function psychically might be robust in all but a few individuals. It might also be the sort of thing we do all or much of the time, and the processes involved may be as removed from conscious awareness and control as those involved in digestion or breathing.

However, even if psi functioning is a largely involuntary universal (or nearly universal) endowment, it may still be situation-sensitive to a degree that frustrates attempted replications. After all, our heart rate and digestion, as well as the capacity to sleep, breathe deeply, or ward off infections, can also vary considerably from one occasion to the next. In fact, if the exercise of psi capacities is need-determined (as some have proposed), then it could be analogous to and as variable as the capacity to increase adrenaline flow, or produce endorphins, or the ability to move or respond quickly, act decisively, or be courageous, or cheerful in difficult times, or selfless when a loved one needs to be protected.

Clearly, without some solid grounding, *prior to experimentation*, concerning what sort of human endowment is being investigated, psi researchers can't expect to know, say, whether replicating an experiment with different subjects is even feasible, or whether it's feasible only if the same subject is re-tested, and then only under conditions as similar as possible to those in earlier successful experiments (assuming that can even be determined with any confidence).

So even though parapsychology's replication scorecard may not match that of most physical sciences, and even though that does not undermine parapsychology's status as a legitimate area of scientific inquiry, the field nevertheless remains at an early stage of investigation. Indeed, until we have a more adequate natural history of psi, worrying about replicability may be pointless. In fact, given our current and considerable level of ignorance, one

could argue that research emphasis should still be on proper documentation and vetting of spontaneous or semi-experimental cases.

—Stephen E. Braude

Notes

[1] See Collins (1976, 1978). Also (and later) Collins (1992). My Collins-inspired discussion was in Braude (1979) and (later) Braude (2002).

[2] For example, Storm et al. (2017) and Cardeña (2018).

[3] Some of what follows I covered in an earlier Editorial—in *JSE* 27:1. Evidently, that effort had the usual lack of impact, and so I figure the topic merits another try. Intrepid readers might want to consult that earlier opus for several points not made here.

[4] I should remind the reader that Collins' original discussions of this issue (and even mine) are considerably more detailed and nuanced. What follows here are simply a few highlights.

[5] For more on the concept of similarity, see Braude (2014:Chapters 1 and 2).

[6] But see Collins (1992) and Braude (2002).

[7] For an extended discussion of this topic, see Braude (2014).

[8] For some of the best, see Eisenbud (1992).

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RESEARCH ARTICLE

Observer Effects on Quantum Randomness: Testing Micro-Psychokinetic Effects of Smokers on Addiction-Related Stimuli

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Abstract—A vivid discussion revolves around the role of the human mind in the quantum measurement process. While some authors argue that conscious observation is a necessary element to achieve the transition from quantum to classical states during measurement (Wigner 1963), some go even further and propose a more active influence of the human mind on the probabilities of quantum measurement outcomes (e.g., Atmanspacher, Römer, & Walach 2002, Penrose & Hameroff 2011). This proposition was tested in micro-psychokinesis (micro-Pk) research in which intentional observer effects on quantum random number generators (RNGs) were investigated. In the studies presented here, we extended this line of research and tested the impact of unconscious goals on micro-Pk. Our focus lies in cigarette addiction as an unconscious drive, and we hypothesized that regular cigarette smokers would influence the outcome of a quantum RNG that determined whether the participant was going to see a smoking-related or a neutral picture. Study 1 revealed strong evidence for micro-Pk (BF_{10} = 66.06), supporting H_1. As expected, no deviation from chance was found with non-smokers. Study 2, a pre-registered highly powered replication attempt, failed to reproduce this result and showed strong evidence for H_0 (BF_{01} = 11.07). When the data from both studies are combined, a remarkable change in effect across time (resembling a combination of appearance followed by decline) can be seen only in the smokers' subsample. Appearance and decline effects were absent in the non-smokers' sample and in a simulation. Based on von Lucadou's Model of Pragmatic Information, we suggest that (micro-)Pk effects follow a systematic pattern comparable to a dampened harmonic oscillation. This concept may shed new light on past and future Pk research.

Keywords: micro-psychokinesis—observation—quantum measurement—mind–matter

Introduction

Theories about the relation between mind and matter belong to the hot topics of current science. Some early interpretations of quantum physics located a possible mind–matter interaction at the measurement process of quantum states. Wigner and von Neumann, for instance, suggested that the act of measurement was only complete when conscious observation of the result has taken place. They argued that conscious observation was the central factor causing the collapse of the wave function, i.e. the transition from quantum to classical states (e.g., Wigner 1963). This transition apparently occurs in a probabilistic fashion (Born 1926). Thus, consciousness was supposed to determine the collapse but not the exact outcome. Although mainstream quantum physics regards quantum-randomness as ontic and inherent in nature (Greenstein & Zajonc 2006), newer theories and empirical findings challenge this view (see Varvoglis & Bancel 2015). According to this research, intended observers might be able to influence the outcome of a quantum experiment. The goal of the studies presented here was to test the effect of motivated observation on quantum processes and to explore corresponding deviations from quantum randomness.

The first discovery of quantum theory started when Plank (1900) detected that energy was quantized into non-divisible packets which he termed "Wirkungsquantum" (quantum of action). Since then through the groundbreaking work of leading physicists such as Bohm, Bohr, Born, de Broglie, Dirac, Einstein, Feynman, Heisenberg, Pauli, Schrödinger, von Neumann, Wheeler, Wigner, and many others, this theory has evolved into a mathematically well-defined framework explaining many phenomena of the micro-world with an astonishingly high degree of accuracy (Byrne 2010, Greenstein & Zajonc 2006). One dramatic implication of this theory constitutes the probabilistic behavior of quantum systems when a measurement takes place. The act of a measurement turns a deterministically evolving quantum state into a probabilistically transformed existence within the macro-world. For example, before a measurement is performed, the place of an electron can be described through a wave function, the so-called Schrödinger equation (Schrödinger 1935). It summarizes all potential locations of the electron within the system, treating them as a superposition. During the act of measurement, however, this electron is found in one specific place only with a probability exactly corresponding to the square of the amplitude of the wave function (Born 1926). This probabilistic nature of the results of an observation is considered to be a basic principle inherent in quantum mechanics. Randomness at the level of a detector signal cannot be attributed to any inaccuracy of the measurement process but is a true and fundamental aspect of nature (but see Bohm 1952, Broglie 1927, 1953).

There is apparently no yet-unknown underlying principle (so-called 'hidden variables') as proposed by Einstein who was unsatisfied with the idea of a probabilistic nature ("God does not play dice") explaining or causally affecting this random behavior (Bell 1964).

Some authors have challenged this proposition, arguing that the human mind plays a central and active role during the measurement process that goes beyond being responsible for the transition to happen. Under specific circumstances, mental processes related to consciousness presumably influence the likelihood of an outcome of a quantum process, leading to slight deviations from randomness. Those scientists revised the standard quantum theory accordingly. Atmanspacher, Römer, and Walach (2002), for instance, developed the Generalized Quantum Theory (GQT) (see also Atmanspacher & Filk 2012, Filk & Römer 2011, Römer 2004). In this framework, a measurement is characterized by an epistemic split that occurs when pre-consciously experienced potential quantum alternatives are transferred into conscious knowledge about one of them. This knowledge transfer can be shaped by the observer's mindset. Observer effects are thus described as entangled correlations between observer and the observed system (von Lucadou & Römer 2007). As a consequence, non-random deviations are allowed, but they should decline shortly after their first detection as will be explained more in depth later. Another revision, the orchOR theory, has been proposed by Penrose and Hameroff (2011) (see also Hameroff 2012, Hameroff & Penrose 1996, Penrose 1989, 1994). In their theory, the act of measurement constitutes an objective reduction of the wave function leading to the emergence of a conscious moment when realizing the result of the measurement. These reductions are at the quantum level gravitation-dependent and mathematically described as small curvatures between space–time geometries that represent the potential quantum states. The authors assume that objective reductions are not random and can be influenced by specific information embedded in fundamental space–time geometries. Penrose identifies these as Platonic values, and they include mental concepts among others (Hameroff & Chopra 2012). Thus, intentional observers might be able to non-randomly influence the transition of potential quantum states into one specific classical state. Similarly, Stapp (2007) equates measurement with the act of conscious observation (see also Wigner 1963) and proposes a conscious choice of the quantum alternatives during the measurement process. Mensky (2011, 2013) takes a different route and provides an extension of the Everettian interpretation of quantum mechanics (Everett 1957). Here he assumes a corrective process, called post-correction, that allows an individual to navigate through the potential quantum worlds. He termed this mechanism 'super-intuition'. Although this

might not be an exhaustive list of the revisions of quantum theory, all these approaches have in common that they postulate a correlation between a mental state of the human mind and the outcome of a quantum experiment. This specific mind–matter interaction will be tested in the studies presented here and has been an empirical challenge for researchers for many decades. Their work has become known as micro-psychokinesis research. We will review and highlight their main findings in the following paragraphs.

Micro-Psychokinesis

Psychokinesis research has a long history and dates back to the early work of Crookes, Horsley, Bull, and Myers (1885), Crookes (1889), James (1896), Richet (1923), and Schrenck-Notzing (1924) during the late 19th and early 20th centuries. In these early years, case study reports and field investigations involving participants who mentally tried to move objects dominated the field (see Varvoglis & Bancel 2015). Later on, in the Rhine era, more scientifically designed studies testing mental effects on random sources such as dice tosses were performed (e.g., Rhine 1944, Rhine & Humphrey 1944). However, it took until the 1960s before the first experimenters used quantum states as a source for true randomness (Beloff & Evans 1961). In this early stage, participants were prompted to influence a quantum superposition of a decayed and non-decayed radioactive state to intentionally slow down or speed up the rate of decay. Later, random number generators that produced numerical outcomes based on quantum sources, so-called true RNGs (tRNGs), became a standard tool in this area of research (Jahn, Dunne, & Jahn 1980, Schmidt 1970a) and have been accompanied by the development of quantum theoretical explanations for psychokinesis ever since (e.g., von Lucadou & Kornwachs 1977, Schmidt 1975, Walker 1975).

During that time the term micro-psychokinesis was born. According to Varvoglis and Bancel (2015),

> micro-psychokinesis can be defined as mental influences on inanimate, probabilistic systems, producing effects that can only be detected through statistical means. The target systems may include tumbling dice, coin tossing systems, or hardware random number generators (RNGs). (p. 266)

Numerous studies have been performed since then testing intended observer effects on true, i.e. quantum, random number generators' outcomes and leading to a vast amount of data even until recently (e.g., Tressoldi et al. 2014). The majority of these studies used an instructed intention protocol where participants were prompted to influence the RNG in a way

that produced a specific non-random visual or auditory outcome. Since we are primarily interested in intended observer effects on quantum systems, we will focus only on research findings obtained with true random number generators (tRNGs). Also, for clarity purposes we decided to summarize the results by referring to aggregated data reported in several meta-analyses authored by the most prominent research groups and skeptics in the field (for an excellent overview, see Varvoglis & Bancel 2015).

The first meta-analysis reported micro-psychokinesic effects of individual mental activity on various kinds of random sources (Radin & Nelson 1989). The 597 experimental studies reported covered a time range from 1959 to 1987 and included experiments using tRNGs but also algorithmically based random number generators, so-called pseudoRNGs. The overall effect size ES ($\times 10^{e-4}$) was always greater than 2 and significantly different from zero for various analyses, indicating that on average mental activity during intended observation had an effect on random outputs in these studies. This meta-finding was confirmed by a followup meta-analysis reported by Radin and Nelson (2003) in which the database was updated with 176 new studies. A more recent meta-analysis by Bösch, Steinkamp, and Boller (2006) included only studies that tested the effect of intended human interactions with tRNGs. This is the only and most complete summary of research investigating mental effects on quantum randomness exclusively. The final analysis of 380 experimental studies covering the years from 1961 to 2004 revealed a significant but very small and heterogeneous overall effect size. This confirmed the results of the earlier meta-analyses that documented an overall micro-psychokinetic effect on different types of RNGs, but this time focusing on tRNGs only. It could be interpreted as tentative evidence favoring the idea of intended observer effects on quantum randomness. However, the authors also observed a correlation between sample size of the studies and their effect sizes. Given the heterogeneity, the small overall effect, and this correlation, the authors speculated that the meta-analytic effect could be due to publication bias (but see Radin, Nelson, Dobyns, & Houtkooper 2006). This raised some doubts about the validity of the effect reported by this meta-analysis. Although many proponents of micro-psychokinesis (e.g., the Princeton Engineering Anomalies Research program PEAR) share a policy of open data and reporting data from all studies that have been conducted—long before the publication crisis reached mainstream psychology and led to the same recommendations—this argument always reappears when new findings or new evidence are presented.

Another, yet more convincing, empirical argument against micro-psychokinesis is the astonishing lack of successful direct replications. One

prominent example for this is the Jahn, Dunne, and Nelson (1987) benchmark experiment done at the PEAR laboratory. It involved data from 2.5 million trials from 91 participants collected over 12 years of research. At the end of the study, they had found a highly significant effect of intended observation on tRNGs, yielding a z-score of 3.8. In 1996 a consortium consisting of two research groups, the Grenzgebiete der Psychologie und Psychohygiene at Freiburg and at the Center for Behavioral Medicine at the Justus-Liebig University of Giessen, started a three-year exact replication attempt. Data involving 750,000 trials per condition from 227 participants were collected and reported by Jahn et al. (2000). The results were disappointing since the overall z-score obtained was not significant. Micro-Pk of this type appeared to not be replicable, and this and similar failures increased skepticism toward PSI. However, a closer inspection of the original PEAR data by Varvoglis and Bancel (2015) revealed that two highly performing subjects seemed to have contributed to about a quarter of the overall effect size observed. According to the authors, this incident led to an overestimation of the proposed average effect size in the population. As a result, the power estimation for the replication attempt was misleading. A much higher sample size would have been needed to document the effect in the replication study than the number that was actually used. Thus, a severely underpowered study served as the test for replicability. This important finding was largely ignored. As a consequence, the replication failure was considered as evidence that no robust effect could be documented.

Another way of dealing with replication failure was to identify potential moderators of the effect (e.g., Bösch et al. 2006), but in many cases this could not account for the failures. Not satisfied by giving up their beliefs in micro-Pk, some authors suggested that PSI effects for specific theoretical reasons cannot be documented objectively in principle. Some argue that such effects are subjective and self-referential processes and that objectivity standards of modern time science do not apply (see, e.g., Atmanspacher & Jahn 2003, Etzold 2004, Kennedy 2003). Von Lucadou (2006, 2015) provided an elaborate model that refers to the concept of "Pragmatic Information". In his framework, novelty and confirmation are considered to be complementary variables. This is true for data obtained with quantum systems that violate the no-signal theorem such as non-random effects on quantum states. Although such effects would be highly novel, they would quickly vanish (or re-appear somewhere else) when confirmation (i.e. replication) efforts were made. Declining effects should therefore be natural in micro-Pk. The main problem with this kind of theory is that the accumulation of scientific evidence would always need to decline and would thus be indistinguishable from replication failures obtained with null effects (Etzold 2004).

The findings within micro-Pk research seemed to be fluctuating, and in the search for potential reasons we as trained experimentalists took one step back during the planning phase of our studies presented here and focused on the independent variable. The majority of the studies using tRNGs manipulated their participants' intentions toward the tRNG by giving explicit instructions such as "try to move up the graph" or "try to delay the decay". In this way the observer's consciousness was put into action assuming that it would affect the quantum random choices. The silent theoretical assumption behind this treats consciousness as being outside the physical reality influencing the physical quantum world like a "deus ex machina". This idea traces back to the origins of quantum mechanics where some researchers emphasized the role of the conscious observer to determine the quantum collapse while keeping the randomness postulate intact (e.g., Wigner 1963, see also von Neumann's position described in Byrne 2010). However, the revised quantum approaches reported above (e.g., Atmanspacher, Römer, & Walach 2002, Mensky 2011, Penrose & Hameroff 2011) regard consciousness only as a byproduct of the measurement process. In these theories both the classical outcome and its conscious experience emerge from a common quantum source during a measurement. Before the measurement takes place, unconscious knowledge of the potential states and quantum superpositions of the different states coexist. This idea was first described by the 'unus mundus' theory developed in a letter exchange lasting from 1932 to 1958 between C. G. Jung and W. Pauli (see Atmanspacher 2012). During quantum measurements, unconscious information and corresponding quantum states evolve into one specific conscious perception of one classical state (either gravitation-dependent: Penrose & Hameroff 2011; as an epistemic split: Atmanspacher, Römer, & Walach 2002; or through mental effort: Mensky 2011, 2013, Stapp 2007). Conscious mental occurrences together with quantum system outcomes are in this way entangled correlations rather than causal effects. True causality takes place in the realm of the unconsciousness.

This theoretical gap between predictions and empirical practice has to some extent been overlooked in previous psychokinesis research. Nevertheless, there is some groundbreaking work that has pursued this idea of passive volitional effects on micro-Pk in the past. For example, the animal-psi work from Schmidt (1970b, 1973, 1979) and Peoc'h (1988, 2001) found micro-Pk effects with different animals. Others reported similar effects with human participants put into meditative (e.g., Bancel 2014, Radin & Atwater 2012, Tressoldi et al. 2014) or various emotional (e.g., Debes & Morris 1982) states. In addition, research that used 'hidden' RNGs also reported evidence for correlations between passive volitional or emotional

states on outputs produced by unknowingly present trueRNGs. The most impressive findings were obtained within the Global Consciousness Project which relates global events to RNG data (see http://noosphere.princeton.edu/results.html#alldata).

Early on, theoretical attempts were also made to explain these effects. The PMIR and 'conformance behavior model' (Stanford 1977) theoretically addressed these non-intentional characteristics of PSI by relating Pk events to the Jungian term 'synchronicity'. According to these models, individuals non-intentionally express their inner states through sudden environmental changes. The GQT (Atmanspacher, Römer, & Walach 2002) is just a more elaborate and mathematically refined version of these early ideas. For a recent overview of this area of research and its relation to the more conscious intention approach, see also Varvoglis and Bancel (2015).

The advantage of the GQT (e.g., Atmanspacher, Römer, & Walach 2002) above these early explanations of micro-Pk is that it breaks up the separation of observer and observed object and includes the observer of a tRNG into the working mechanics of the output generator. The observer with their unconscious desires and the tRNG with its potential outputs during the quantum processing stage are considered to form a unity within an experimental trial. This entity subsumes an undivided co-existence of potential quantum states and unconscious desires before a conscious observation takes place. The act of observation then non-randomly results in a state of perceiving one tRNG output that is more likely in line with the underlying desire.

From this perspective, the micro-Pk studies that used intentional instruction protocols, such as the Jahn, Dunne, and Nelson (1987) PEAR study and others, might also produce the expected effects but only if the participants were able to form intentions in a way that included simultaneous activations of corresponding unconscious desires. In other words, the intentional instruction protocol needed a two-step induction procedure to ensure success, whereas our goal was to directly activate the unconscious mode. This might also explain why there are often reports of strong individual differences in the traditional approaches as Varvoglis and Bancel (2015) found for the original PEAR experiment and which were also present in Schmidt's work. Only individuals who were able to deeply ground the artificially induced instruction into their selves and related unconscious system might be able to produce an effect in such designs.

Encouraged by these findings and based on the GQT (Atmanspacher, Römer, & Walach 2002), we thus proposed to directly manipulate the unconscious desire of our participants instead of their conscious intentions. This could be achieved by either manipulating the unconscious desire

experimentally or pseudo-manipulating the unconscious desire by using pre-established desires within certain individuals toward a specific state (that is a physical state that is correspondent to the desire). Hence, we designed the independent variable in our studies using a primarily unconsciously driven intentional state, the desire for cigarettes within smokers and compared it to non-smokers. We tested its effect on a tRNG that on each trial randomly chose pictures displaying either cigarette-related or neutral content. In this way, we tried to close the aforementioned gap as much as possible.

With regard to the direction of the effect, two opposite outcomes were equally likely. On one hand, the smokers' unconsciously rooted desire could affect the tRNG toward an increased likelihood for cigarette pictures. That is on average smokers should observe more of those pictures than expected by chance. No deviations from chance level were expected for non-smokers. Another completely opposite prediction was derived from the emotional transgression model, developed by the author MM. Since some smokers are addicted, they should have an unconsciously grieving drive toward cigarettes. On the unconscious level, they experience a permanent deficit of nicotine and therefore are convinced of not having enough of it most of the time. This unconscious fear of not "having enough" translates into a self-fulfilling prophecy of never getting enough. For smokers, this should on average result in a less-than-chance observation of cigarette pictures, an outcome that would reflect the deficit on the physical level. No statistically relevant deviations from chance were expected for non-smokers.

Since the direction of the effect investigated in our first study was unclear, we started with a two-tailed hypothesis stating that the average score of cigarette pictures should deviate from chance for smokers but not for non-smokers.

Study 1 Methods

All research presented was conducted in accordance with the ethical requirements of the American Psychological Association (APA). The instructions did not reveal the study's purpose, but ensured the data's anonymization and emphasized the participants' choice to withdraw from the experiment at any given time.

Consent

Voluntary participation was ensured, and written consent was obtained from all participants. If participants were interested, an explanation about the study's purpose was given individually after the tasks were completed. This procedure and the experiment were approved by the ethical board of the Department of Psychology.

Participants

In sum, 254 participants have been tested in the first study (145 female, 109 male; mean age = 30.3 years, *SD* = 12.88). The sample size was a result of the Bayesian sequential design that will be explained more in depth later. Participants were recruited through the department's announcement board, handouts in psychology classes, Facebook university groups, and through direct contact by the experimenters. Participants enrolled in the university's psychology bachelor's degree classes were able to acquire credits within their program.

Smokers and non-smokers were identified via self-assessment. Upon arriving at the experiment, all participants were asked to provide information about their smoking behavior. They were asked to choose between 'being a regular cigarette smoker' (at least 1 cigarette per day), 'being a smoker of other tobacco products' (e.g., pipe), 'being a casual smoker', 'being a non-smoker', and 'being a former smoker'. Only participants who smoked cigarettes regularly were labeled as smokers. Casual smokers, i.e. participants who smoked less frequently than daily, and former smokers were labeled as non-smokers. Also, smokers of other tobacco products (e.g., pipe) were assigned to the group of non-smokers since the addiction-related stimuli used in the experiment focused on cigarettes. In addition, the German version of the Fagerström Test for Nicotine Dependencies (FTND-G) (Schumann, Rumpf, Meyer, Hapke, & John 2003) was used to assess the degree of nicotine addiction within the group of smokers. Finally, the attitude toward smoking was assessed with all participants via a questionnaire containing 10 statements about smoking. Participants were asked to indicate their level of agreement toward positive (e.g., *smoking is fun*) or negative (e.g., *smokers smell badly*) statements. These two questionnaires were only used for exploratory purposes.

Materials

Software and computers. The study was conducted on a set of four different laptops that had all been prepared in an identical fashion. Due to this, differences in the presentation of the experiment were minimal at most, e.g., due to slight differences in the size of the display. The stimuli were presented on a black background with a size of 500 × 400 pixels. A presentation procedure was programmed in C# that translated the output of the random number generator into choosing either smoking-related (cigarette) pictures or non-smoking pictures.

Stimuli. Non-smoking pictures were taken out of the International Affective Picture System (IAPS) (Lang, Bradley, & Cuthbert 2008), which

provides an experimental set of 1,169 digitized photographs rated on arousal and valence using a 9-point rating scale. A set of 10 neutral (mean valence = 4.90, *SD* = 1.09) and unexciting (mean arousal = 2.61, *SD* = 1.86) pictures displaying everyday objects was chosen. Addiction-relevant stimuli (cigarette pictures) were taken out of the Geneva Smoking Photographs (GSP) (Khazaal, Zullino, & Billieux 2012), a normative database providing 60 addiction-relevant photographs for nicotine and tobacco research. A set of 10 pictures was chosen from the database providing variation in terms of product, smoking behavior, and tobacco-related cues (e.g., cigarette packs, ashtrays, smoking individuals, etc.).

Generation of quantum randomness. A tRNG, a quantum number generator (Quantis-v10.10.08) developed by the company ID Quantique from Geneva, was used (http://www.idquantique.com/random-number-generation/quantis-random-number-generator/). This apparatus produces quantum states by using photons that are sent through a semi-conductive mirror-like prism. The photon has an equal chance to be deflected in one or another direction producing a superposition of both states until a measurement is performed. Upon measurement, the photon is found on either route with a 50% probability. Depending on the track it was found on, a numerical score such as 0 or 1 is generated (technically Quantis transforms 8 such bits into 1 byte). This procedure is thus a reenactment of the famous double-slit study known in quantum physics testing the wave–particle duality. This hardware passed all serious tests of randomness such as the DIEHARD and the NIST tests (see certificates from various independent agencies on the website) and is one of the most effective tRNGs worldwide (Turiel 2007). In this way a true quantum source for randomness was established within each experimental trial.

Experimenters

For this study, informally trained research assistants were used as experimenters. Their task was to find smokers and non-smokers in equal numbers. They had only rudimentary knowledge about the aim of the experiment at the point of data collection. Data for smokers and non-smokers were randomly collected. The experimenters sent their raw data to the study supervisor on average every other day, depending on the number of participants tested.

Procedure

Participants were tested in different locations with mobile testing stations. This was necessary since most student participants were non-smokers,

forcing experimenters to expand the participant pool beyond students. Experimenters made sure to test in a distraction-free environment with no other persons present. At the beginning of the experiment, experimenters read a written instruction to the participants:

> Thank you for participating in this experiment! In the first part of the study you will sit in front of the computer and look at pictures. I know that this can be very tiring, I am asking you nonetheless to not get distracted and focus your attention on the computer for the whole time of this part. It is *absolutely necessary* for this experiment that you look at the pictures! This will take approximately 10 minutes. Of course you can quit the experiment at any time, should you feel uncomfortable.
>
> As soon as you have finished there will be a message on the screen. Please let me know, so I can prepare the computer for the second part of the experiment. This will be a questionnaire. Filling it out will take about 5 more minutes. All data are collected anonymously.
>
> Do you have any questions?

When the participant had no more questions, the experimenter opened the software and told the participant to start the display of the pictures by pressing the spacebar as soon as they were ready. To avoid any interference by the experimenters, they were instructed to stay aside and distract themselves mentally during the experiment while checking on the participant only once in a while.

Participants attentively observed a consecutive series of 400 photographs. A tRNG decided if the next photograph would be pulled out of the set of addiction-related stimuli or out of the neutral stimuli. A software program used the randomness process of Quantis to decide which of the stimuli in the chosen set would be displayed. Stimuli were chosen by sampling without replacement. This means in the second trial there were only 9 pictures to choose from in each set since the "partner image" in the set not shown would be dismissed as well, in the third trial 8, and so on. After every 10th trial, all pictures had the same probability to be chosen again. This process ensured that each picture in either category had an equal chance to be displayed over the course of the experiment. Therefore, different aspects of smoking had an equal chance to affect the participant. Participants looked at a centered cue (700 ms) first, then at the addiction-related or neutral stimuli (400 ms), and finally at a black screen (400 ms). This process was repeated 400 times (see Figure 1).

After the completion of the picture-presentation, the experimenter opened a batch file that added a unique code to the data and connected the code to the questionnaire that was subsequently opened via a web browser.

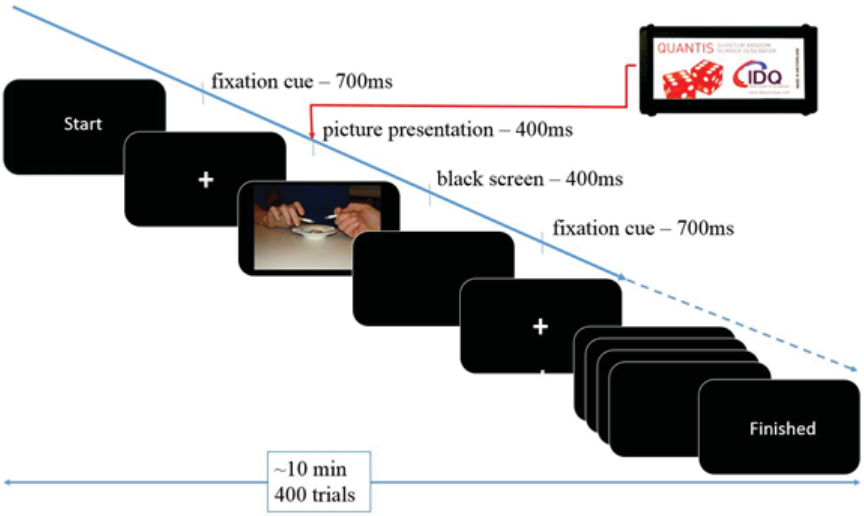

Figure 1. The 400 trials of the experiment consisted of the display of a fixation cue, a smoking or non-smoking-related picture, and a black inter-trial interval.

Data Analysis

Data collection and analysis was performed by using Bayesian inference techniques for hypotheses testing as recommended by Wagenmakers, Wetzels, Borsboom, and van der Maas (2011). The Bayesian theorem provides us with information on how to update our beliefs given new incoming data. Whereas the frequentist approach makes assumptions about theoretically repeated replications of the same study, the Bayesian method accumulates data concerning the effect and repeatedly updates the likelihood for an effect given the additional data. The strength of evidence for the effect is in this framework considered to be dependent on both the likelihood of the data given that H_0 is true as well as on the likelihood of the data given that H_1 is true. Thus, to find out whether the data provide more evidence for H_1 or for H_0, these two likelihoods are pitted against each other. The resulting score is called the Bayes Factor (*BF*) and resembles the relative amount of evidence that the data provide for or against a postulated effect. This way, the existence and the non-existence of an effect can be tested against each other within the same dataset. A Bayes factor of 10 or higher is considered to indicate strong evidence for H_1 or H_0, respectively.

In order to calculate the Bayes Factor, a probability distribution for effect size that is centered around zero with scale parameter r needs to be specified a priori. This Cauchy distribution ($\delta \sim$ Cauchy (0, r)) identifies the prior, i.e. the likelihood of the data given there is an effect, i.e. p(data|H1). Wagenmakers et al. (2011) recommend an r equal to 1. The statistical software JASP designed to perform basic Bayesian analyses uses a default r of .707. Other authors recommend a lower r of .5 (Bem, Utts, & Johnson 2011) or of .1 (Maier et al. 2014) knowing that PSI effect sizes are usually very small (mostly in the range of .1 to .2). The choice of the prior provides a degree of freedom within the Bayesian approach. For data analysis in the studies presented here, we decided to use an r of .5, i.e. $\delta \sim$ Cauchy (0, .5). This score was determined before data collection was started.

Bayesian hypothesis testing comes with several valuable advantages. One is that the Bayes Factor combines information about the effect and the sample power within its score. A high *BF* can be reached only when sufficient power is provided through sample size, whereas the frequentist approach might accidentally detect an effect within a severely underpowered study. Thus, although the frequentist approach needs an a priori power analysis and pre-definition of sample size to compensate for this potential problem, the a priori definition of sample size is not necessary when applying Bayesian techniques. On the contrary, the Bayesian approach allows for data accumulation, i.e. additional subjects can be tested and included in the dataset until a pre-specified *BF* criterion for H_1 (or H_0) has been reached.

This also permits optional stopping after hitting the *BF* and is therefore a more effective way of hypothesis testing than the frequentist method. We decided to use a Bayesian sequential design with a *BF* of 10 as a stopping rule. The Bayes factor was monitored on a regular basis and data collection was stopped as soon as the stopping criterion was met. Nevertheless, additional data were available at this point and we decided to include all available data in our analysis, resulting in a slightly larger sample size than necessary. Since researchers in the field of psychology are more familiar with the frequentist approach and less so with Bayesian hypotheses testing, we outlined the reasons for using the Bayesian approach in the studies presented here in more detail. Before the study, we also decided to analyze the data with a Bayesian one sample *t*-test. For each subgroup, smokers and non-smokers, separate tests have been applied, each testing the respective sub-sample's mean score of cigarette pictures against chance level. For all Bayesian analyses, the statistical software tool JASP (Version 0.8.2) (JASP Team 2017) has been used.

Study 1 Results

In this first study, the authors of this paper disagreed about the expected direction of the effect tested here. On the one hand, it was proposed that smokers through their desire for cigarettes unconsciously attract pictures displaying those items. Hence, smokers should affect the random number generator to produce on average more than 200 cigarette pictures, since 200 was the expectancy value for purely random selections. On the other hand, the emotional transgression model views the desire for cigarettes within smokers as an anxious expression of a deficit, i.e. smokers supposedly believe they have actually not gotten enough of it. This in turn should be similar to a self-fulfilling prophecy and decrease the number of cigarette pictures being presented to smokers than expected by chance. Thus, a mean score of less than 200 could also have been expected. To account for the controversial predictions of both models, a two-tailed approach was chosen to test any substantial sample mean deviations from chance level. For non-smokers, null effects were expected, i.e. evidence for H_0 should be found.

Data for smokers and non-smokers were tested separately by one-sample Bayesian *t*-tests (two-tailed) with 200 as testing criterion and mean number of cigarette pictures as dependent-variable. As outlined above, data for each subsample were accumulated and repeatedly tested when new data came in until at least one Bayes factor of 10 or more was reached.

Smokers

The final Bayesian *t*-test analysis with 122 smokers yielded a *BF* of 66.06 for H_1. The mean score of cigarette pictures for these participants was mean = 196.7, *SD* = 9.87, indicating very strong evidence for the effect that participants who identified themselves as smokers viewed fewer smoking-relevant pictures than expected by chance. The graph below represents a sequential analysis of the Bayes factor for smokers (see Figure 2).

No significant correlations between the average mean score of cigarette pictures and the level of addiction measured with the Fagerström Test for Nicotine Dependencies nor between the score and the attitude toward smoking were found (see Table 1 in the Appendix).

Non-Smokers

The same analyses were performed with participants identifying themselves as non-smokers. The final Bayesian *t*-test analysis with 132 smokers yielded a *BF* of 6.13 for H_0. The mean score of cigarette pictures for these participants was mean = 200.5, *SD* = 9.68, indicating moderate evidence

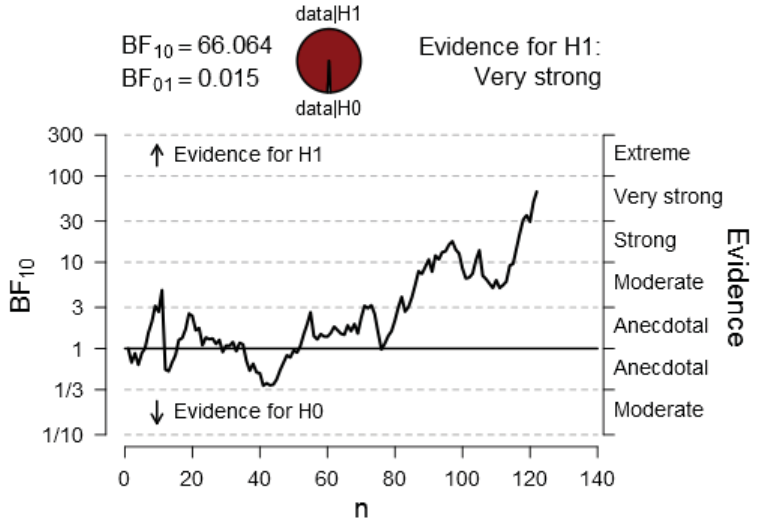

Figure 2. The curve displayed within the graph indicates the temporal change in *BF* when additional smokers were tested, i.e. when more and more evidence was included in the analysis.

for the null effect.[1] Participants who identified themselves as non-smokers viewed on average a number of smoking-relevant pictures around the chance level. The graph below represents a sequential analysis of the Bayes factor for non-smokers (see Figure 3).

From the beginning, a clear trend toward H_0 could be seen.

Study 1 Discussion

The results of Study 1 provide evidence for a very substantial deviation of the mean number of cigarette pictures from chance level among smokers. Smokers who passively observed the pictures chosen at each trial by a highly sophisticated and effectively working quantum random number generator seemed to unconsciously affect the quantum process toward non-randomness. They saw fewer cigarette pictures than was expected if the tRNG were working in a purely random fashion. Assuming that the generator was working properly, this would mean that motivated human observation can produce deviations in quantum randomness in line with their underlying desire. The data also support the emotion transgression model that predicted on average a negative deviation of smoking-relevant pictures for this group of individuals. A *BF* much higher than 10 also underlines the robustness of this effect. It states that it is 66 times more likely to obtain such data if H_1 is true than if H_0 had been correct.

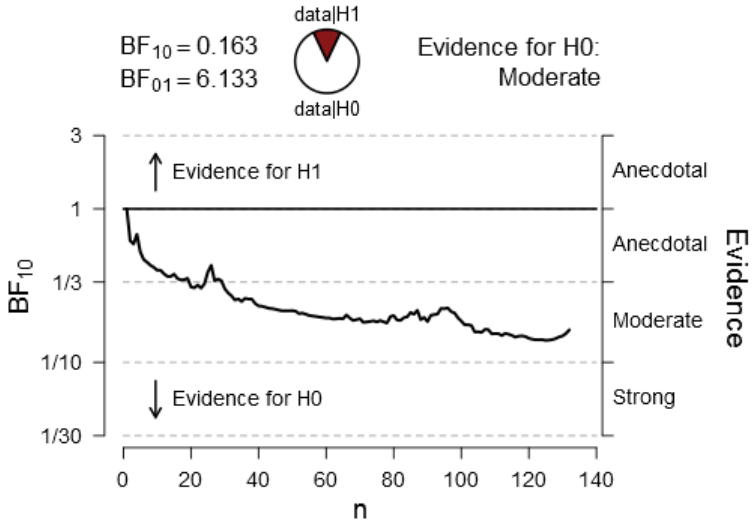

Figure 3. The curve displayed within the graph indicates the temporal change in *BF* when additional non-smokers were tested, i.e. when more and more evidence was included in the analysis.

For non-smokers, moderate evidence for a null effect was found supporting the idea of random presentations of the cigarette pictures on average across the trials. Since non-smokers should not have had any desire toward the picture sets, they should also lack any motivated observation. Thus, no influence on quantum choices was expected as reflected by the data of this subgroup. One could argue that non-smokers might have had strong rejecting attitudes toward cigarette pictures and should therefore also be considered to be motivated observers. However, we think that this attitude is not based in a deep physically grounded anti-desire as compared to the desire existent within smokers and therefore is not deeply enough rooted in someone's existence. Our model of motivated observation restricts mind-quantum randomness interactions to those deeply rooted motives and goals only. This is supported by a correlation, r = .05 (BF_{01} = 10), between attitude toward smoking and the number of smoking-related pictures within the overall non-smokers group, indicating strong evidence for no impact of this attitude on non-random picture presentations.

Overall, the data are in line with our predictions and with similar research documenting effects of the human mind on quantum random number generators (for an overview, see Varvoglis & Bancel 2015).

To test the robustness of the effect reported above, we decided to do an exact replication of Study 1. Although replications are the cornerstone

of empirical research and although conceptual replications are available for micro-Pk (for an overview see, e.g., Bösch et al. 2006), there is a lack of successful one-to-one replications for a central experiment in micro-Pk research, the PEAR study (see Varvoglis & Bancel 2015).

This spectacular example involves the replication failure of an original experimental protocol developed and performed by the PEAR lab at Princeton University (Jahn, Dunne, & Jahn 1980). This study was attempted to be replicated by a combined research group from the Institute für Grenzgebiete der Psychologie und Psychohygiene at Freiburg and the Center for Psychobiology and Behavioral Medicine at Justus-Liebig University Giessen (Germany). The replication attempt failed and could not find evidence for intended observation on RNGs. Although Varvoglis and Bancel (2015) offered an explanation for the failure by proposing an overestimation of the original effect size due to outliers' data, a number of scientists also speculated about the inherent elusive manner of PSI effects, arguing that such mind–matter interactions involving the quantum realm are based on subjective and self-referential processes and therefore cannot be documented objectively (see, e.g., Atmanspacher & Jahn 2003, Kennedy 2003). Von Lucadou (2006, 2015) went further and provided a model based on the idea of Pragmatic Information proposing that quantum effects that violate the "no-signal theorem" need to vanish when researchers try to replicate them. According to him, the amount of initial novelty a data pattern contains with regard to this theorem is reciprocally related to the amount of later confirmation: The stronger the violation the quicker the disappearance (or re-appearance somewhere else) of this effect in an additional data collection.

Although superficially knowing about the hassle of replication in this area of research and the discussion around it, we ignored these warnings for two reasons: First, a *BF* of 66.06 gave us a pretty firm belief that the effect would show up again in an exact, careful replication. And second, if an effect was not replicable, any attempt at its empirical documentation would not make sense from the beginning. Since we had already done Step 1, we felt we had to do Step 2 as well.

Study 2 Methods

In Study 2 we performed an exact replication of Study 1. The study was pre-registered at the Open Science Framework (OSF) (https://osf.io/4fzq8). Procedural details, including selection of the participants, stimuli, apparatus, experimental protocol, and questionnaires used were the same as in Study 1. Also the statistical analyses were the same with one important change: The effect within the smokers in Study 2 was tested using a one-

tailed statistical approach. The reason for this change was that after Study 1 we had a clear prediction about the direction of the effect. We expected smokers to show a lower-than-chance deviation with regard to the mean number of cigarette pictures being observed. All these procedural details and statistical techniques were pre-specified in the preregistration. Again, a prior distribution of $\delta \sim$ Cauchy (0, .5) was used.

Apparatus, Stimuli, and Procedure

All experimental setups were the same as in Study 1.

Participants

In sum, 175 smokers and 220 non-smokers (208 female, 184 male, 3 chose not to specify their gender; mean age = 31.30, *SD* = 13.11) were tested in the second study. Acquisition strategy and their labeling were done in the same way as reported above. Data collection again was stopped as soon as a Bayes factor reached 10 in either direction, resulting in a similar but slightly larger sample size than in Study 1.

Consent

Voluntary participation was ensured, and written consent was obtained from all participants. If participants were interested, an explanation about the study's purpose was given individually after the tasks were completed. This procedure and the experiment were approved by the ethical board of the Department of Psychology.

Study 2 Results

Data for smokers and non-smokers were tested separately by one-sample Bayesian *t*-tests with 200 as the testing criterion and the mean number of cigarette pictures as dependent-variable. As outlined above, data for each subsample were accumulated and repeatedly tested when new data came in until at least one Bayes factor of 10 or more was reached.

Smokers

The final Bayesian *t*-test analysis with 175 smokers yielded a one-tailed *BF* of 11.07 for H_0. The mean score of cigarette pictures for these participants was *M* = 200.3, *SD* = 10.38, indicating strong evidence for the null effect. Smokers viewed an average number of cigarette pictures close to and not different from chance level. The graph below documents a sequential analysis of the Bayes factor for smokers (see Figure 4).

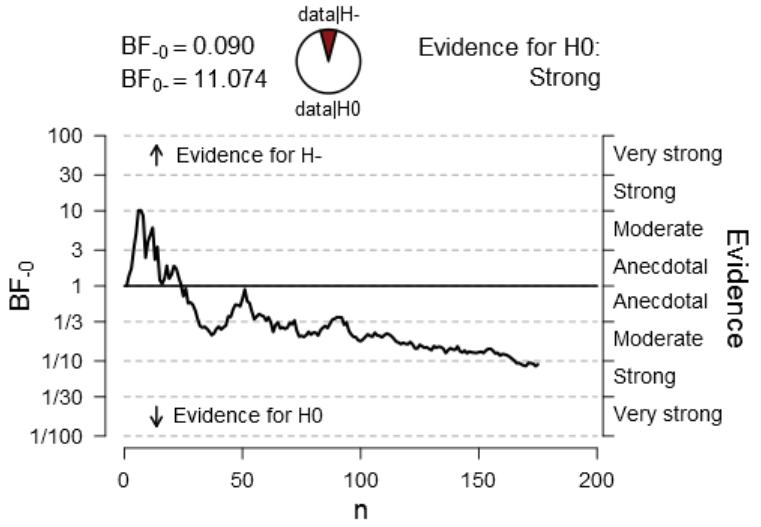

Figure 4. The curve displayed within the graph indicates the temporal change in *BF* when additional smokers were tested, i.e. when more and more evidence was included in the analysis.

No significant correlations between average mean score of cigarette pictures and the level of addiction and attitude toward smoking was found (see Table 2 and Table 3 in the Appendix for an analysis for both studies combined).

Non-Smokers

The same analyses were performed with participants[2] based on their self-reports being labeled as non-smokers. The final Bayesian *t*-test analysis with 220 non-smokers yielded a two-tailed *BF* of 3.74 for H_0. The mean score of cigarette pictures for these participants was mean = pictures around chance level. The graph below represents a sequential analysis of the Bayes factor for non-smokers (see Figure 5).

Study 2 Discussion

Contrary to our predictions made in the pre-registration phase of the study, the results of Study 2 did not replicate the effects found in Study 1. For smokers, strong evidence for the null hypothesis was revealed. Moderate evidence for the null effect was also found for non-smokers, which was in line with our predictions. It seems that the data pattern shown by the smokers is with each added subject consistently moving in the opposite

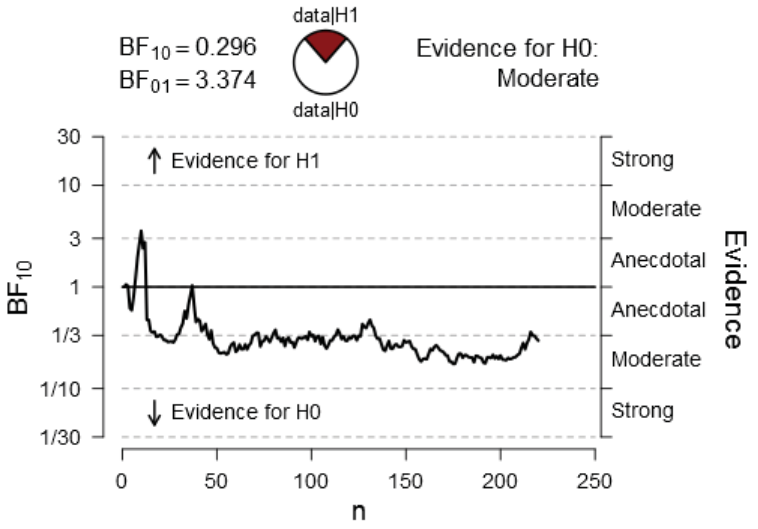

Figure 5. The curve displayed within the graph indicates the temporal change in *BF* when additional non-smokers were tested, i.e. when more and more evidence was included in the analysis.

direction of that found in Study 1. Although initially the effect was strongly present within the first 10 to 20 participants, it quickly dropped, and, given the mean score, even went in the opposite direction. Overall, applying the standards of scientific research we need to declare that the replication attempt clearly failed and a robust effect could not be determined.

When looking at the Bayesian sequential analyses (Figures 2 to 5) separately for smokers and non-smokers and separately for Study 1 and Study 2, some interesting patterns are noteworthy. Non-smokers in both studies uniformly show a null effect through the course of each experiment, indicated by a smooth asymptotic trend toward evidence for H_0. In contrast, smokers in Study 2 who eventually revealed a clear null finding displayed a quite volatile trend before they hit the stopping criterion. Smokers within the first 20 participants in this group initially almost reached a $BF_{10} = 10$ in evidence for the H_1 before the trend went in the opposite direction. This is surprising and stands in contrast to all trends for non-smokers or any simulation performed (see below). Although random fluctuations might be a plausible explanation for this, it could also be considered as a hint that additional mechanisms might be at work. One potential explanation might be individual differences that might moderate the effect within the smokers between Study 1 and Study 2. This would imply that certain personality

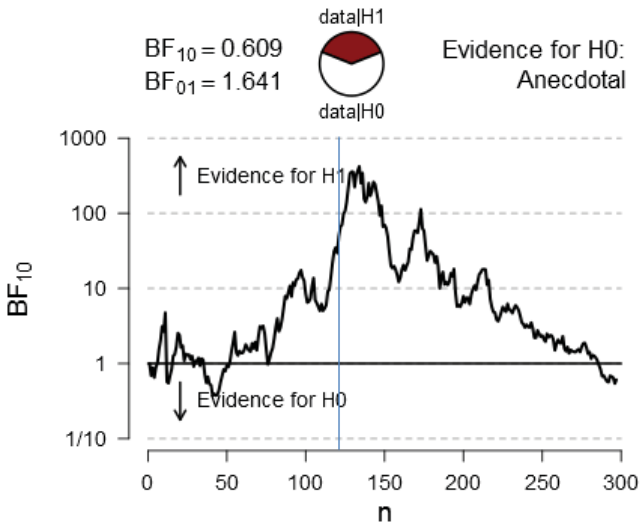

Figure 6. The curve displayed within the graph indicates the temporal change in *BF* when additional smokers were tested, i.e. when more and more evidence was included in the analysis. The transition from Study 1 to Study 2 is indicated by a vertical line at *n* = 122.

traits were strongly different in Study 1 compared with Study 2. Although we do not have empirical data to rule out this alternative explanation, we do not think that individual differences could fully account for the effect changes between the studies. One had to assume that a specific personality pattern would be present in the first experiment and an opposite one in the other. Such a homogeneous distribution of personality types within studies yet opposite between studies seems rather unlikely. We tried to make sure that smokers for both studies were invited from the exact same population. In addition, changes in emotional states or relevance of the pictures might also not fully explain the difference in the results. The moderators should have had an equally strong impact on the data of Study 1, which would have made the observed result of strong evidence for H_1 almost impossible. Rather we think that a more lawful mechanism could be responsible for the effect changes. We will elaborate on this idea in the following sections.

The raw data of both studies are available at the Open Science Framework (OSF): https://osf.io/4fzq8.

Overall Analyses of Study 1 and Study 2

In a final set of analyses, we included all data from Study 1 and Study 2 into one dataset to document the overall *BF* scores and the overall sequential

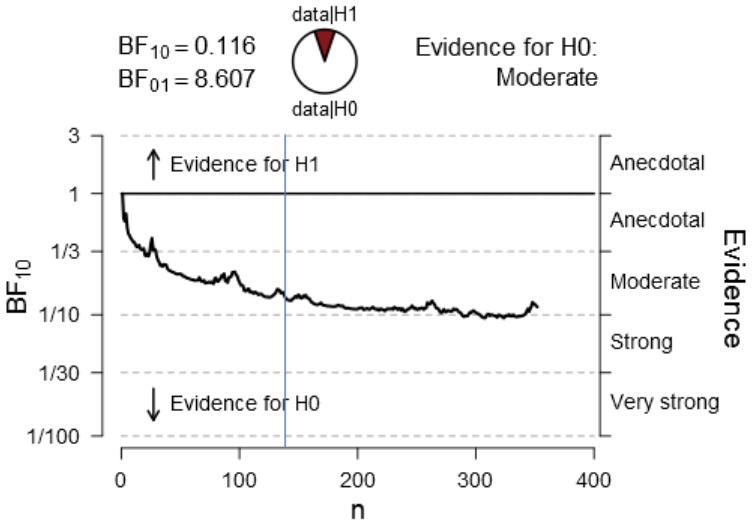

Figure 7. The curve displayed within the graph indicates the temporal change in *BF* when additional non-smokers were tested, i.e. when more and more evidence was included in the analysis. The transition from Study 1 to Study 2 is indicated by a vertical line at *n* = 132.

analyses. Data from identical experiments can be included in one analysis within Bayesian statistics, since this approach evaluates the accumulative evidence for or against an effect. All parameters were the same as in the studies reported above. For all following analyses, a two-tailed approach was applied.

Smokers Combined from Study 1 and Study 2

A Bayesian *t*-test with 297 smokers yielded a *BF* of 1.19 for H_1. The mean score of cigarette pictures for these participants was $M = 198.8$, $SD = 10.31$, indicating no evidence for either H_1 or H_0. The graph before the previous graph documents a sequential analysis of the Bayes factor for smokers (see Figure 6).

Non-Smokers Combined from Study 1 and Study 2

A Bayesian *t*-test with 352 non-smokers yielded a *BF* of 8.61 for H_0. The mean score of cigarette pictures for these participants was $M = 199.6$, $SD = 10.11$, indicating moderate evidence for H_0.[3] The graph above represents the sequential analysis of the Bayes factor for non-smokers (see Figure 7).

Discussion of Both Studies

An obvious detail when comparing both graphs of the overall analyses is that there was a strong change in effect across time (= additional participants) within the smokers' data, but no such change appeared within the non-smokers' dataset. One could argue that the temporal change of effect observed in smokers is just a random fluctuation. We therefore conducted a simulation run in which the experiment was executed without any observing participants.

For the simulation, one of the computers was equipped with mouse-recording software. This software handled the experimental software by itself in the same way the participants did. To get comparable results to our combined smokers' data, it was set to run until $n = 297$ datasets were collected. A Bayesian *t*-test showed a *BF* of 6.65 in favor of H_0 ($M = 200.6$, $SD = 10.06$). As can be seen from the sequential analysis in the graph below, no strong change appeared in the data over time. Development of the effect and final result rather resemble those of the non-smoking group (see Figure 8).

General Discussion

Our goal in the two studies presented here was to test micro-psychokinetic effects of unconsciously rooted desires during the observation of quantum experimental outcomes. Smokers and non-smoker participants were told to look at pictures that were randomly chosen by a true random number generator at each trial. Pictures with neutral or cigarette-related content each had a 50% chance of appearance. Before observation, both picture types were supposed to exist in a superposition. Through the act of measurement, the observer's unconscious mind was assumed to select the one of the two states with a slightly higher likelihood that best fits their unconscious desires. We focused on unconsciously rooted intentional states of the observers rather than on conscious intentions, since the theoretical models from which our hypothesis was derived postulate a desire-driven non-random emergence of classical states and their conscious perception out of the realm of the unconscious (see, e.g., Atmanspacher, Römer, & Walach 2002, Mensky 2013, Penrose & Hameroff 2011). Thus, mental activity originating from an observer's unconscious was assumed to causally affect motive-driven biases from randomness. In two studies, we tested the hypotheses that an observer's unconsciously rooted desire toward cigarettes should affect the tRNG's quantum probabilities for cigarette picture presentations. In Study 1 the mean score of cigarette pictures obtained with smokers was predicted to deviate from chance (two-tailed approach). In Study 2 a deviation lower than chance was expected (one-tailed approach). Null effects were expected for non-smokers.

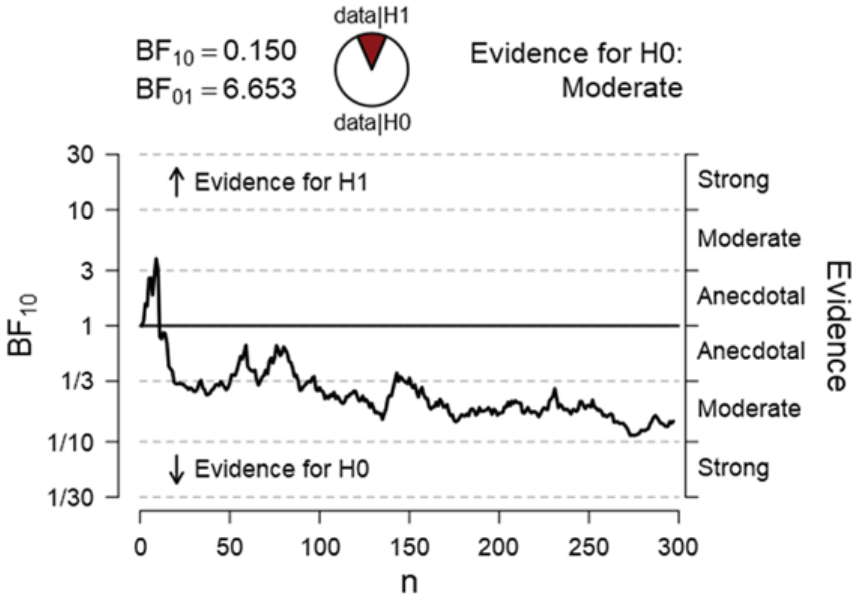

Figure 8. The curve displayed within the graph indicates the temporal change in *BF* when additional simulated participants were created, i.e. when more and more evidence was included in the analysis.

The results were rather mixed. In Study 1 strong evidence for H_1 was found, indicating that on average smokers observed fewer cigarette pictures than expected by chance. No deviations from chance were found with non-smokers. This is in line with the revised quantum models described above that also allow for observer-dependent deviations from randomness. The results also match with the prediction of the emotional transgression model: If the unconscious mind of the cigarette-smoking observer is convinced of not having had enough cigarettes yet, it will bias the random selection toward a lower likelihood for cigarette pictures. Thus, the unconscious belief and the established reality coincide similarly to a self-fulfilling prophecy. Subjectivity of smokers turns into objectivity here.

In Study 2, a pre-registered replication attempt, strong evidence for H_0 was found within the smoker group. This was unpredicted and surprising since a BF_{10} of 66.67 found in Study 1 was considered to provide a high likelihood for replication success, and the earlier effect could not easily be attributed to a chance finding of an underpowered sample. The overall analysis which included the data from all the smokers tested in both studies illustrated the temporal change of effect from initial appearance to later

complete disappearance. Non-smokers in both studies and in the overall analysis as well as a simulation that contained no human interaction at all showed moderate to strong evidence for no deviations from randomness. No remarkable changes in evidence for H_1 to H_0 in the course of the experiment were detected in this subgroup and the simulation data. As expected, with increasing data accumulation a smooth trend toward strong evidence for H_0 was found.

How can this data pattern be interpreted? According to the standards of scientific practice, an unequivocal replication failure indicates that there is no robust micro-psychokinesis effect in this data. Thus, the randomness postulate of quantum mechanics remains intact. This also casts doubt on the validity of the revised quantum theories presented by Atmanspacher, Römer, & Walach (2002), Mensky (2013), and Penrose and Hameroff (2011). 'No replication—game over' is what the data are saying.

Common sense would recommend accepting this as the ultimate answer to our research efforts. However, there are some indications both from other research findings as well as within our data that urge us to speculate a bit more about the existence of micro-Pk reported here despite the lack of replication. There are similar reports of replication failures of originally strong effects. One famous example is the huge micro-Pk study conducted by the PEAR group (Jahn et al. 1987) that could not be replicated by an independent research team (IGGP Freiburg and CPBM at the University of Giessen reported in Jahn et al. 2000). Parallel to this case many others have reported decline effects despite originally strong evidence (see Radin 2006). This led to speculations about moderators but also to the development of theoretical models trying to understand such decline effects. The most elaborate one was proposed by von Lucadou (2006, 2015) and is based on the idea of Pragmatic Information. According to this proposal, quantum effects such as micro-psychokinesis that violate the "no-signal theorem" should vanish when additional data are collected. The initial novelty of a study should reciprocally be related to the likelihood of later confirmation. The stronger the observed violation was, the quicker the effect would disappear during replication efforts. This would exactly match our dataset whereby an initial occurrence suddenly changes with additional data collection to a disappearance of the effect. This temporal variation was neither observed in the data obtained with non-smokers nor in the simulation where null effects were obtained throughout the data collection. This difference is striking and supports von Lucadou's (2006, 2015) assumption, admittedly on a post-hoc basis only.

The theoretical problem with this approach, however, is that real null effects documented by replication failures of spurious findings cannot

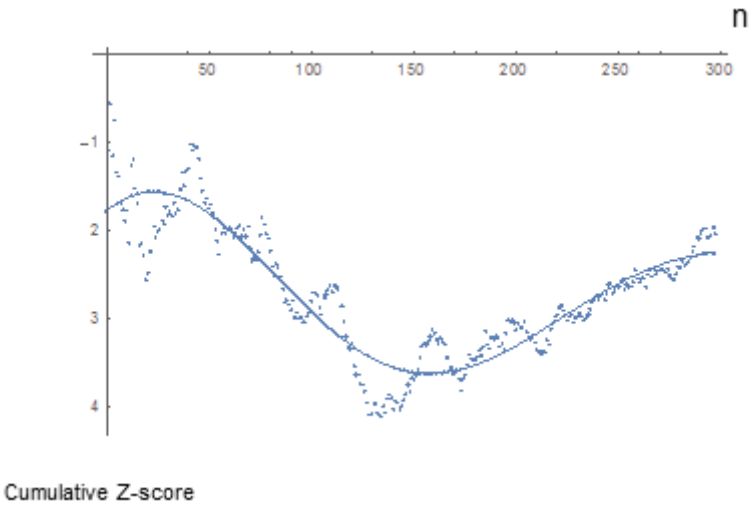

Figure 9. Cumulated Z-Score of the effect (z-transformed cumulative average score for cigarette pictures for smokers) with curve-fitting.

be distinguished from decline effects. The consequence is that with the standard scientific replication approach micro-psychokinesis effects cannot be scientifically studied. Either way, this would mean we should abandon PSI research from science (for a similar argument, see Etzold 2004).

Nevertheless, we suggest a way out of this dead-end situation. Going a bit beyond von Lucadou's (2006, 2015) Model of Pragmatic Information, we speculate that maybe the lowered confirmation trend follows a systematic pattern. A violation of the no-signal theorem in quantum physics constitutes a severe violation of the Second Law of Thermodynamics that states that entropy needs to increase over time. Hence, we assume that at the moment of the occurrence of mentally induced deviations from quantum randomness entropy sets in to counteract this trend. Once the effect has weakened, the entropic counterforce also decreases, allowing the effect to reappear although with a lowered effect size than initially shown; this interplay between effect and entropy should lead to a temporal change in effect comparable to a dampened harmonic oscillation. We estimated a mathematical function describing such a harmonic oscillation with our smokers' data (see Figure 9).

The function displayed in the Figure 9 graph was obtained with curve-fitting algorithms using the mathematical software tool Wolfram Mathematica Version 11.1.1.0 (https://www.wolfram.com/mathematica/):

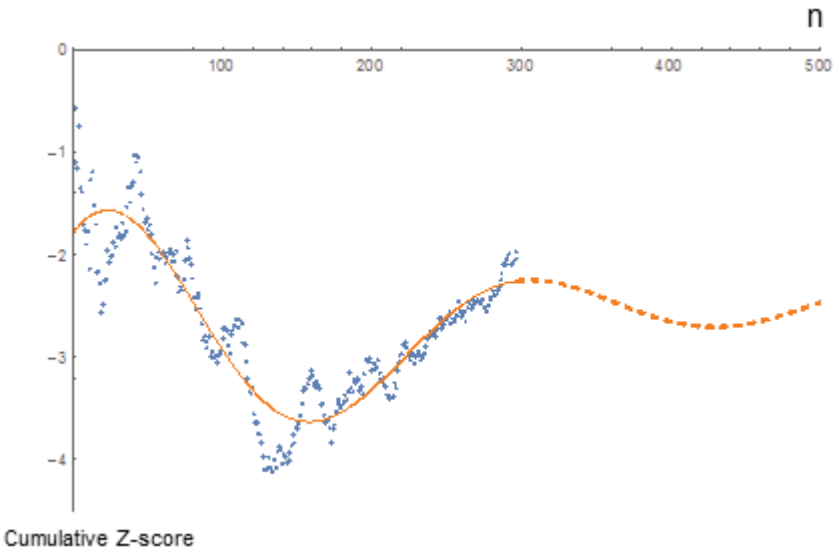

Figure 10. Cumulative time z-score of the effect (z-transformed cumulative average score for cigarette pictures for smokers) with curve-fitting and extrapolation (dotted line) to 500 subjects.

$$y = -1.650641811645734\, e^{-0.004549840402099492t} \cos(0.022532398160298193t + 2.457511536269481) + 0.0013342140582305 25t - 3.064904989339309$$

with y representing the effect (negative scores indicate a cumulative average score below chance) and t representing the participants in temporal order of data collection.

The prediction derived from this function would be that within the next not-yet–tested 200 smokers the effect should reappear to a lower degree in effect size and further slightly oscillate down toward the zero line. Our trend prediction can be inferred from the dotted line (Figure 10) which is an extrapolation of the accumulated effect when additional data are collected. The local maximum for this additional data should occur around subject number 410 to 450. The exact z-score for the maximum might be around −2 to −3 but could also be lower due to a further decline trend which is actually not present in the estimated part of the graph.

Our research group is currently working on similar trend estimations with other datasets, and up to now this approach seems promising. However, at present we admit that this idea of a *systematic* decay of a micro-Pk effect supplementing von Lucadou's model is highly speculative, and the goal here is just to inform other research groups about our findings and to

encourage them to re-analyze their data with harmonic oscillation functions of this kind:

$$y(t) = \alpha e^{-\beta t} \cos(\omega t + \varphi) + mt + h$$

Future research will show whether systematic decline effects can be documented and thus whether micro-psychokinesis can still be studied scientifically or not.

In addition, an alternative explanation for this null effect in Study 2 or for the oscillating pattern might also be found in experimenter effects on micro-Pk that are specifically tied to the Bayesian approach. Bayesian sequential analysis requires a continuous observation of the evidence for or against the effect. The experimenter might unconsciously affect the evidence through his expectations. In Study 1 the experimenter might have been confident about finding the expected effect, but in Study 2 due to the preregistration he might have been fearing and thus anticipating a failure. In other words the experimenter himself could evoke an oscillating micro-Pk effect on the data fully explaining the decline effect found. Such experimenter effects are discussed in Pk research (e.g., Varvoglis & Bancel 2015), and suggestions to avoid them should be taken seriously. We are not sure whether this would fully explain the non-existence of the effect in Study 2 or its oscillation, but in future research an "experimentally and theoretically blind" data analyst or an automatic analysis procedure that simply indicates when the stopping criterion is met would be recommended. For now the conclusion about the results of our studies is: There is no evidence for micro-Pk, but . . . !

Notes

[1] To gain a deeper understanding of the null effect (H_0) within the non-smokers' group, separate analyses were conducted on different subgroups of non-smokers. As can be seen from the results for casual smokers (n = 34, M = 200.7, SD = 9.33, BF = .27), former smokers (n = 12, M = 201.1, SD = 8.94, BF = .40), strict non-smokers (n = 82, M = 200.5, SD = 10.16, BF = .19), smokers of other tobacco products (n = 4, M = 197.3, SD = 6.55, BF = .65), as well as a more conservative non-smokers group consisting of strict non-smokers and former smokers who stopped smoking for at least 1 year (n = 93, M = 200.77, SD = 10.0, BF = .19), no unusual differences were found, indicating that our addiction-related stimuli did not produce an effect and these groups can be combined.

[2] Analyses for subgroups of the non-smoking sample were conducted for casual smokers (n = 36, M = 198.7, SD = 8.88, BF = .34), strict non-smokers (n = 137, M = 199.8, SD = 10.60, BF = .14), smokers of other tobacco products

(n = 9, M = 201.6, SD = 8.02, BF = .47) and the conservative non-smokers group (n = 168, M = 199.0, SD = 10.74, BF = .28). Former smokers showed a moderate deviation from the expected mean (n = 38, M = 195.6, SD = 10.74, BF = 3.33).

[3] Regarding the subgroups, a slightly different result was only found for former smokers (n = 50, M = 196.9, SD = 10.52, BF = 1.39).

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Appendix: Correlational Analyses

TABLE 1
Correlations among Mean Score of Cigarette Pictures, Positive Attitude Toward Smoking (Attitude), and Addiction Score on the Fagerström Test for Nicotine Dependencies (Fager_Score) for Study 1

		CP	Attitude	Fager_Score
Cigarette Pictures	Pearson's r	—		
	BF_{10}	—		
Attitude	Pearson's r	−0.062	—	
	BF_{10}	0.142	—	
Fager_Score	Pearson's r	−0.030	0.010	—
	BF_{10}	0.119	0.114	—

TABLE 2
Correlations among Mean Score of Cigarette Pictures, Attitude Toward Smoking, and Level of Addiction for Study 2

		CP	Attitude	Fager_Score
Cigarette Pictures	Pearson's r	—		
	BF_{10}	—		
Attitude	Pearson's r	0.184	—	
	BF_{10}	1.821	—	
Fager_Score	Pearson's r	0.018	0.079	—
	BF_{10}	0.097	0.162	—

TABLE 3
Correlations among Mean Score of Cigarette Pictures, Attitude Toward Smoking, and Level of Addiction for Both Studies Combined

		CP	Attitude	Fager_Score
Cigarette Pictures	Pearson's R	—		
	BF_{10}	—		
Attitude	Pearson's R	0.123	—	
	BF_{10}	0.681	—	
Fager_Score	Pearson's R	0.005	0.059	—
	BF_{10}	0.073	0.121	—

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RESEARCH ARTICLE

A Study on Reported Contact with Non-Human Intelligence Associated with Unidentified Aerial Phenomena

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Abstract—This study, conducted by the Dr. Edgar Mitchell Foundation for Research into Extraterrestrial and Extraordinary Experiences (FREE), represents the first comprehensive investigation on individuals (N = 3,256) who have reported various forms of contact experience (CE) with a non-human intelligent being (NHI) associated with or without an unidentified aerial phenomenon (UAP). Our research methodology utilized two comprehensive quantitative surveys totaling 554 questions administered to subjects with reported non-hypnotic memory recall of their CE. This survey addressed a diverse range of physical, psychological, perceptual, and paranormal aspects of reported non-hypnotic–based recall of both physical and/or non-physical interactions with an NHI. The results revealed complex reported CEs that involve both physical and non-physical events (psychological outcomes, non-ordinary states of consciousness, and paranormal experiences). What may be the most significant aspect of the interim results is that approximately 70% (N = 2,279) of the study population claimed that their CE changed their life in a "positive way." In contrast, only 15–20% reported a "negative" impact from their CE. Further, the majority of subjects did not report events typically associated with the traditionally held beliefs regarding the "alien-abduction" phenomena. That is, the results suggest that the reported CE with an NHI is largely non-physical and can occur via telepathy, during an out-of-body experience, being floated into a "matrix-like" reality, as well as through physical interaction on board a craft. Consequently, the results suggest that a non-physical ("contactee") CE is distinctly different from a physical ("abduction") CE and should be studied as separate but interrelated anomalous

events. In fact, the CE associated with a UAP is not the predominant form of CE, and sighting a UAP is not necessarily associated with a CE. Consequently, future studies should not focus exclusively on the analysis of UAP sightings and traces alone which, based on decades of research, have not advanced our understanding of the possible force that governs and regulates this complex phenomenon. This is an important consideration since the FREE study dispels the notion that contact with NHIs must always entail either a physical abduction or a landed craft with beings interacting with humans. This study may serve as a needed foundation for researchers to build upon for validation purposes to better understand a unique and diverse range of reported physical and non-physical type CEs with an NHI associated with or without a UAP.

Introduction

A major contributing factor to the lack of scientific research has been an apparent reluctance on the part of the general scientific community to conduct unidentified aerial phenomena (UAP) research or to take it seriously, possibly due to fear of ridicule, limited interest, or the negative reputation of "ufology." This is a field felt to be filled with hoaxers, deceived or possibly disturbed individuals, and New Age seekers, and many academicians regard publishing in this field to be a "career-ending" event, fearing potential scorn and ridicule from colleagues. Moreover, the fact remains that leading UAP researchers have failed to convince the scientific community that even their best cases represent adequate evidence to stimulate either the interest of granting agencies or institutional support. The UAP-related phenomenon of "alien abduction" has been likewise dismissed as an illusory byproduct of "false memory syndrome" or "sleep paralysis" (Clancy 2005, McNally 2012). Some notable exceptions in applying scientific methods have been individuals such as J. Allen Hynek, James E. McDonald, and Jacques Vallee; although known as authors and speakers, scientists of their stature have for the most part communicated their ideas and findings about UAP to lay audiences, rather than to scientists via refereed professional journals.

Existing research on the nature and essence of the interaction and subsequent behavioral outcomes for those who report contact experiences (CEs), with or without the associated UAP, are virtually absent. Most studies have focused exclusively on personality and cultural factors associated with CE reports to help formulate theories (e.g, psycho-cultural, psychological, physiological, atmospheric, extraterrestrial, and intra-dimensional, etc.) to account for the phenomena. To date, however, no testable theories of what may govern and regulate either the UAP or CE have been proposed or empirically confirmed. And while some theories may sound more plausible

than others, theories alone do not provide sufficient proof to explain the variables that control or regulate this phenomenon. Consequently, any existing theories of the alien abduction phenomena (AAP) or, more generally, the CE, should be regarded as tenuous at best.

The so-called "alien abduction" narratives have inspired much theoretical speculation, but experimental research has been scarce. This phenomenon is grounded in personal human experiences deemed extraordinary by witnesses themselves. Historically, several academics took the study of UAPs seriously and regularly engaged with ufologists, including astronomers and astrophysicists William Hartmann, J. Allen Hynek, Donald Menzel, Carl Sagan, Rudy Schild, and William Powers, physicists James McDonald and Peter Sturrock, computer scientist Jacques Vallee, psychologists David Saunders and Leo Sprinkle, and sociologist Ron Westrum. Among these individuals, however, opinions about the phenomenon differed sharply: McDonald, for instance, firmly believed evidence pointed to the extraterrestrial origins of unidentified flying objects (UFOs); Hynek considered that UAPs warranted serious scientific investigation, but questioned alien abductions; Vallee emphasized the psychosocial dimensions of UAP sightings; and Sagan considered "alien" visitation improbable, but communication with extraterrestrials possible.

Given this brief historical context, the primary objectives of the present study by the Dr. Edgar Mitchell Foundation for Research into Extraterrestrial and Extraordinary Encounters (FREE) pertain to the reported physical, psychological, paranormal, and perceptual effects and/or outcomes associated with the CE. This study includes a large sample of subjects (N = 3,256) who report having physical- and non-physical–based CEs with one or more forms of non-human intelligence (NHI) associated with or without a UAP. More specifically, this study represents the first quantitative analysis of a large population that is both multi-language and cross-cultural, which addresses numerous topic areas associated with the CE. According to FREE's co-founder Dr. Edgar Mitchell (2014), FREE is

> concerned with how consciousness works and its relation to the origin of life and its current condition, the codependency and interconnectedness of all life with itself and its environment, including the past, present, and future evolution of our Universe and everything in it.

The FREE considers that The Quantum Hologram Theory of Consciousness (QHTC), which explains the nature of our reality and non-ordinary states of consciousness, may provide a foundation for understanding the interrelationship among the various "contact modalities" (e.g., CE, near-death experiences (NDE), out-of-body experiences (OBE), mystical

meditation travel, channeling, remote viewing, among other reported human encounters with NHI) which appear to represent non-ordinary states of consciousness. Consequently, all of these "contact modalities" are not regarded as separate phenomena but instead may represent an interrelated phenomenon with multiple consistencies that affect consciousness (Swanson 2003, 2010, Hernandez 2013, Guiley 2013, Schild 2014, Davis 2015, 2017).

Given this context, the FREE study attempted to capture the essence of the reported CE from thousands of individuals as a means to explore the possible nature of "consciousness." That is, a comparative research analysis of the role and impact of the CE on one's reported spiritual and behavioral transformations may provide insight into the significance of consciousness within the context of the CE. This paper, therefore, represents an analysis of both physical and non-physical (perceptual, psychological, and paranormal) interactions and outcomes facilitated by the CE in CErs. The possible theories that may govern and regulate the CE will be addressed in future papers developed by FREE.

Overview

The CE has inspired much theoretical speculation, but experimental research has been scarce. Interestingly, interactions reported with NHI beings have been described in various contexts throughout history (e.g., people from the heavens or stars, often called gods, angels, or spirits), and there exist parallels to such events as described within folklore, religion, and anthropology. Similarities between this experience and shamanic journeys and stories of fairies also suggest that modern accounts of interaction with NHI may be related to the history of such unexplainable encounters. John Keel (2013), who was one of the first to recognize this, and others, including Vallee (1977) and Steiger (1999), have also indicated the similarities between modern UAP reports of so-called "alien abductions" and the ancient traditions. Even astronomer Carl Sagan (1963) theorized that such stories of contact that are common throughout history share remarkable similarities with the "alien abduction experience."

The interpretation that UAPs are extraterrestrial or extradimensional in origin provides a foundation for understanding the CE. If UAPs are non-earthly craft, the CE becomes remotely plausible, but if they are nothing more than natural or man-made phenomena, then the CE may be explained by one or more "non-alien" theories such as the false-memory syndrome, sleep paralysis, psychological disorders, and/or psycho-cultural factors, among others. But even if NHI beings are not interacting with humans, the CE is still an extraordinary mystery worthy of further study by psychologists and sociologists, in addition to meteorologists, physicists, and other natural

scientists. If NHI beings are interacting with humans, how can it be proven?

The absence of irrefutable evidence to support the belief by many UAP researchers that an alien intelligence has visited Earth also applies to the CE. The strongest evidence to support the CE is the consistency of the experience by those claiming to have been abducted, by Hopkins (1987), Jacobs (2000), and Mack (1999). This anecdotal evidence, concomitant with the controversial physiological effects that may accompany the AAP such as scars and implants, and the absence from expected locations at the time of abduction, verified independently in a few cases by Mack (1999), provide the primary evidence to support the CE. Researchers also report that "alien abductions" occur in different members of the same families at different stages of their lives. But since the scientific community considers the UAP phenomenon highly unlikely, the CE, by default is also considered a remote possibility. This is based, in large part, on the absence of compelling physical evidence to validate that UAPs are extraterrestrial craft. The lack of objective evidence in the form of corroborating physical evidence for first-hand accounts of alien abductions also serves to invalidate "alien abduction" claims, and provides support for one or more "non-alien"–related theories. The scientific community has also dismissed the CE on the basis of research-supported psychological explanations, which include biased or inaccurate memory, unreliable perception, social pressures motivating lies, and hypnotists influencing highly suggestible witnesses.

Several investigations have concluded that approximately 90–95% of all reported UAPs are explainable, with the remainder being of unknown origin (Project Blue Book 1969). Since a very small percentage cannot be reliably identified as "known" objects or events, the key question is whether or not the collective evidence of the 5–10% unexplained UAPs represents a non-earth physical craft governed by a form of NHI. While controversial, those who contend that UAPs are intelligently controlled believe sufficient evidence exists in many forms to support their position. This includes the similarity of anecdotal testimony by both credible and multiple UAP witnesses, simultaneous radar and visual sightings, declassified government/military documents, and inexplicable UAP maneuvers, among others. An all-encompassing theory, however, has to be proposed to describe this small percentage of UAPs.

It is important to note that the FREE does not claim to provide a definitive explanation of this phenomenon. The research objective is to simply present the study results to facilitate discussion and continued multidisciplinary and transdisciplinary research in this arena. This research is just an initial step in a long process to better understand what governs and regulates the CE. It is also hoped that this paper will help others to better

understand a unique and profound personal event that may have facilitated pronounced behavioral and psycho-spiritual (i.e. states of awareness and values such as ethical, aesthetic, humanitarian, and altruistic) outcomes in CErs. At the very least, the FREE hopes to stimulate the thinking of the general population as well as enlist support of some of the world's leading academicians and researchers. The quantitative results developed from a large database of CErs may provide a more comprehensive and informative representation of this phenomenon to gain greater understanding of a unique and transformative experience shared by many thousands if not millions of individuals worldwide who are yearning for an answer.

Methodology

Objective

This study incorporated a comprehensive quantitative survey totaling 554 questions completed by subjects ($N = 3{,}256$) from more than 100 countries via the online program Survey Monkey. The interim analysis presented in this article represents the outcomes of our ongoing study as of April 10, 2017. It is important to note that a specific subset (i.e. CErs) of the general population was targeted for inclusion to accomplish the objective of this study. That is, to better understand the essence and impact of the type of CE on the individual's personal viewpoints and values, a recruitment strategy was developed to generate a large database of CErs who reported physical ("Abductees") and non-physical ("Contactees") type CE(s) with an NHI associated with or without a UAP.

Subject Recruitment

Since only a few studies (Ring 1984, Marden & Stoner 2012) with small sample sizes have examined the relationship between the type of CE (abduction vs. contactee) and behavioral outcomes in CErs, an attempt was made to generate a large database of CErs for study. Consequently, this subsection of the population was purposely targeted from sources where CErs were expected to be found. Unlike previous studies that focused solely on "abductions," our subject recruitment process centered on informing individuals, organizations (ufology, parapsychology, psychology, physics, consciousness, and near-death and out-of body experiences, among others), researchers, authors, radio stations, and websites that might facilitate a diversity of CErs (abductees and contactees) to visit our website to complete the survey. This resulted in a large subject population comprising CErs who reported having had one or more CEs with an NHI being associated with or without physical interaction with a UAP. Thus, the study conclusions apply only to this specific subsection of the general population.

Study Survey

The survey questions were modeled after those applied by psychologist Kenneth Ring (1984) in his study with subjects who reported having either interacted with a UAP or having had an NDE. These questions were modified by members of FREE who have had research experience with survey design and knowledge of the UAP literature. The survey was divided into two phases (Phase 1, N = 3,256, and Phase 2, N = 1,919). The analysis of responses obtained in Phase 1 helped to inform us of additional questions for the Phase 2 survey. All subjects who participated in Phase 2 completed Phase 1. That is, only those subjects who completed Phase 1 were invited to participate in Phase 2. The qualitative information received from subjects in Phase 3, composed of written responses to 70 open-ended questions administered to those who completed both Phase 1 and 2, will be analyzed and addressed in another study. All subjects provided consent to participate in this study, and all responses were anonymous except for their email addresses.

While few studies have focused on limited survey questions pertaining to a UAP "abduction" (fewer than 50), the FREE study explored areas that have never been comprehensively addressed in this arena. More specifically, 554 questions made up our survey which addressed six major topic areas. The topic areas addressed in Phase 1 and 2 of the survey are as follows:

Phase 1: a) Family history of contact, b) Contact experience, and c) Nature of non-human intelligence.

Phase 2: a) Information received from non-human intelligence, b) The physical experiences resulting from non-human intelligence contact, and c) Psychological aspects of the contact experience.

The wide range of attributes covered is the biggest difference between the FREE research study and the few studies in this field, most of which focus exclusively on the psychological profile of the "abductee" as reported by Bullard (1987), Hopkins (1987), Jacobs (2000), and Mack (1999), among others. It is important to note that none of the subjects in the FREE study responded to the survey while under hypnosis, i.e. they were asked to respond to the questions only if they had "conscious" recall of their CE(s) not with hypnosis.

Assessment of Potential Response Bias

One potential source of bias in any survey occurs when respondents are undermotivated to complete the survey and hurry through the survey task, checking responses in a haphazard way. These respondents are often referred to as "speeders." In order to assess the integrity of responses by completion time, respondents were divided into four groups, based upon time spent on

the survey. Start time and date and completion time and date were logged by Survey Monkey for each respondent, such that a duration (time spent on survey) could be calculated for each respondent. Based upon this duration score, four groups were constructed for the Phase 1 survey: less than 10 minutes (n = 434), 10–20 minutes (n = 511), 21–30 minutes (n = 575), and more than 30 minutes (n = 1,736). The Phase 1 survey consisted of 102 response items, although some items permitted multiple responses ("Check any that apply . . . "), resulting in a total of 166 "response opportunities." On average, respondents endorsed 48% of these opportunities. Respondents spending less than 10 minutes skipped many items, endorsing only 9% of these response blanks, while the 10–20 minute group endorsed 43%, and the remaining two groups (21–30 minutes and >30 minutes) averaged 55% of response blanks completed.

There was some tendency for "speeders", those spending less than 21 minutes, to skip more items and to be somewhat more negative in evaluating the impact of their contact experience in "changing your life in a Negative or Positive way" (F = 4.24, p < .006). However, given that the positivity question was near the end of the Phase 1 survey, only a small fraction of "speeders" remained to rate this item (3% of the <10 minutes group, 33% of the 10–20 minute group), so "speeders" tended to have a relatively small influence on the majority of response items. A visual inspection of "speeder" responses to both rating and fill-in/verbatim items did not reveal any obvious attempts at frivolous or insincere responses—their reported occupations and descriptions of experiences appeared similar to those of other respondents. Thus, a decision was made to include their responses in the Phase 1 analysis.

For the Phase 2 survey, "speeders" constituted less of a concern, despite the survey length (434 response items), since respondents continuing into Phase 2 were a subset of Phase 1 and thus appeared to be motivated to continue with the survey process. For Phase 2, the same four duration categories established and analyzed for Phase 1 were constructed: <10 minutes (n = 133), 10–20 minutes (n = 64), 21–30 minutes (n = 49), and >30 minutes (n = 1,645). Of the 1,891 respondents who started the Phase 2 questionnaire, 71% (n = 1,335) completed the last 10 questions on the survey, which was identical to the completion rate for Phase 1 (71%). What is most surprising about the Phase 1 and Phase 2 surveys is that almost three-quarters of the large respondent samples for each Phase were motivated to complete these lengthy questionnaires in the absence of any incentive or reward.

Another potential source of bias on surveys results from "acquiescence" (i.e. the tendency to agree with any and all statements). In the Phase 1

survey, directionality of response scales for individual items was mixed, so that in some cases endorsing a "5" on a five-point Likert scale was the most positive option, and in other cases, a "1" on the scale was most positive. Similarly, on the Phase 2 questionnaire, for some attitude change items, selecting a "Strongly Increased" on a 5-point Likert response scale represented a favorable attitude change, whereas on other response items, the same response option would represent an unfavorable attitude change. Changing directionality of item wordings should therefore have mitigated any response biases toward response scale position or acquiescence.

Social desirability bias, or the tendency for survey participants to respond in ways consistent with societal norms or beliefs and to ascribe positive traits to themselves, is more difficult to evaluate for the FREE survey. Endorsing response items indicating very frequent interaction with NHI, telepathic communication with NHIs, or decreased interest in organized religion, would all appear to be admitting to things that are socially undesirable, or in some cases could be regarded as an admission of psychopathology. Yet, the majority of survey respondents checked response options consistent with these experiences. Consequently, if participants were attempting to conform to prescribed societal norms and expectations, for the majority of respondents a different set of norms or group identifications must have been operating.

The Psychology of Contact Experiencers

All subjects in the FREE study reported that they had "never been diagnosed with a mental illness by a licensed mental health professional." The application of a standardized psychological test, however, could not be applied due to the significant time and cost involved. Consequently, the lack of an objective evaluation of the psychological/personality state of the subjects is an acknowledged confounding variable of this study. Despite this limitation, however, indirect evidence from prior studies has shown that the personality characteristics of those who report having been "abducted" may not be different from the general population.

Several researchers, for example, have emphasized that since abductees "do not suffer from psychopathology," there is no a priori reason to reject their reports because their personality characteristics make them less reliable than other reporters of phenomena (Appelle 1995, Jacobs 2000, Parnell & Sprinkle 1990, Mack, McLeod, & Corbisier 1996, Mack 1999, and Hopkins 1987). In one study, Appelle (1995) confirmed that "assessment by both clinical examination and standardized tests has shown that, as a group, abductees are not different from the general population in terms of psychopathology prevalence." In a study of more than 800 alleged abductees,

Mack, McLeod, & Corbisier (1996) also concluded that neurophysiological explanations such as sleep paralysis and temporal lobe epilepsy, proposed as a basis for the "alien abduction phenomenon," have "either failed to find such pathology among abduction experiencers or have chosen to overlook important aspects of the phenomenon." Based on this study, the researchers concluded that "the majority of abductees do not appear to be deluded, confabulating, lying, self-dramatizing, or suffering from a clear mental illness." Baumeister (1989) also ruled out psychological interpretations such as lies, attention-seeking behavior, mental illness, and desire for victim status as possible causes for abduction reports. In a study by Parnell and Sprinkle (1990) on 225 subjects (ranging from those who made no claim of observing a UAP to those who reported observing a UAP craft or occupants, having been taken aboard a craft, or having communicated with UAP occupants) who completed the Minnesota Multiphasic Personality Inventory, the researchers concluded that even those who reported occupant sightings and communication with NHIs performed within the normal range on items such as mood stability, psychomotor excitement, bohemian behavior, and flight of ideas.

It appears that the scientific community, which is unable to explain the unusual consistencies of the AAP, dismiss it on the basis of psychological explanations such as biased or inaccurate memory, unreliable perception, social pressures motivating lies, and hypnotists influencing highly suggestible witnesses. Forrest (2008), for example, concluded that several predisposing factors such as sleep paralysis, a history of being hypnotized, and preoccupation with the paranormal and extraterrestrial, are largely responsible for the belief held by those who feel they were abducted by aliens. In a study of 18 abductees, French et al. (2008) concluded that abductees show higher levels of dissociativity, absorption, paranormal belief, paranormal experience, self-reported psychic ability, fantasy proneness, tendency to hallucinate, and self-reported incidence of sleep paralysis. Additionally, Newman and Baumeister (1996) explained the AAP on a cognitive basis which involves the "integration and elaborations of hallucinations" aided by hypnosis. Thus the "pitfalls" of hypnosis are believed to contribute to the AAP. However, since about 30% of abduction reports are obtained without hypnosis (Mack, McLeod, & Corbisier 1996), a non-hypnotic explanation must be made to account for their reports. Based on a literature review of psychological studies of "abduction experiencers," Marden (2017) concluded that

> fantasy-prone persons with thin boundaries; individuals who experience dissociative states high on the multiple personality disorder scale; and those who experience certain sleep anomalies (narcolepsy); might believe they have been abducted by aliens, when they have not.

This conflicting evidence makes it difficult to adequately explain the role of the abductee's psychological state and associated report of his/her CE. However, it would seem highly unlikely that the vast majority of subjects in our study suffer from a mental illness that would contribute to their reported CE. The evidence that abductees are not different from the general population in terms of psychopathology, however, does not exclude the possibility that a certain percentage of our subject population may have, for whatever reason(s) (e.g., false memory, hoax, and/or psychological disorder, etc.), provided inaccurate information in their survey responses. Nevertheless, the large subject population in our study likely mitigates any significant contribution of this questionable subject population on the overall results reported in this study. Added support for this position is represented by the finding that approximately 70% of our large study sample contend to have had "positive" behavioral outcomes resulting from their CE, which is not consistent with many symptoms typically associated with common psychological disorders (e.g., fantasy-prone personality, dissociative states, boundary deficit disorder, and delusional behavior, and schizophrenia). Ideally, future research should compare predisposing, consequent, and/or resultant personality attributes of CErs of this kind.

Results

The Demographic Breakdown of the Study Population and Consistency of Reported Contact Experiences

Critics who challenge the validity of reported CE with NHI often claim that CErs are simply recounting cultural stories, and myths from their own culture as depicted in movies, books, and legends prevalent in their culture. If this were the case, we would expect to see noticeable variations across different nationalities and ethnic groups in the types of NHI beings encountered, the positivity or negativity of the reported experiences, frequency of experience, and types of craft observed, and nature of paranormal phenomena perceived in connection with the contact. The findings presented in this study, however, argue against the notion that CEs are some kind of aberrant experience that has simply been filtered through cultural myths, since it is unlikely that the cultures, myths, and memes would be so consistent across the countries and ethnic/racial backgrounds represented in the survey results. The results presented indicate that when samples sizes are sufficiently large for reliable reporting, they tend to be consistent across national and racial/ethnic boundaries as follows: 1) The features associated with sighting a UAP craft, 2) Conscious recollection of being on board a UAP craft, 3) The types of NHI beings encountered, 4) The types of paranormal phenomena

TABLE 1
The Racial and Ethnic Breakdown of the Study Population

	Percent of Sample	Number of Subjects
American Indian or Alaska Native	1.6%	52
Asian	1.2%	38
Black or African American	1.0%	34
Native Hawaiian or Other Pacific Islander	0.2%	6
White/Caucasian	70.7%	2,303
American Indian/Alaska Native and Another Race Code, not Hispanic/Latino	4.0%	131
Multiple race code without American Indian or Alaska Native or Hispanic/Latino	1.1%	35
Hispanic or Latino	2.5%	83
Hispanic or Latino and another race code, not American Indian or Alaska Native	4.8%	157
Hispanic or Latino and American Indian or Alaska Native	1.3%	43
Missing	11.5%	374
Total	100.0%	3,256

experienced, 5) The frequency of reported encounters with NHI, and 6) The positivity of impact of CE upon respondents.

The comparison of Phase 1 (N = 3,256) and Phase 2 (N = 1,919) by age and gender are shown in Table 1. The Phase 1 and Phase 2 data were merged using the only identifier for each survey record, which was their email address. After eliminating 233 different surveys where two or more people used the same email address, 1,686 Phase 2 survey records remained that were aligned with Phase 1 demographic questions. This permitted a comparison of Phase 1 and Phase 2 age and gender demographics, which

were remarkably similar. More specifically, of the 3,256 subjects in Phase 1, 57% were female and 43% male. Similarly, of the 1,686 subjects in Phase 2, 58% were female and 42% male. The majority of subjects (55% in Phase 1, and 57% in Phase 2) were between the ages of 45 and 64 years. The mean age of the subjects at the time of the study was 49.5 years (SD = 13.6, range 18–86 years) for each sample in Phase 1 and 2.

The racial and ethnic breakdown of the study population in Table 1 indicates that the study population is overwhelmingly White/Caucasian (70.7%), with less than 5% constituting other population categories. Since the percentage of African Americans, Hispanic and Latino Americans, and Asians in the U.S. were 13.3%, 17.8%, and 5.8%, respectively, as of July 2016 (U.S. Census Bureau 2016), the results are not necessarily generalizable to the population distribution in the United States, or to African American, Hispanic, or Asian populations of CErs.

Table 2 illustrates that the majority of subjects were from the U.S. (64.1%), Canada (8.4%), Australia (8.3%), and the United Kingdom (7.2%). These four countries constitute more than 88% of the respondent sample. The subjects from the remaining 84 countries each represented less than 1% of the study population (8.1% of the total sample; range of 16 to 30 individuals) and are not as reliable for demographic analyses. Since the U.S. sample comprised almost two-thirds of all Phase 1 respondents, the total sample average of all countries would be little different from the U.S. average. Thus, a decision was made to weight each country equally when calculating averages across countries shown in Tables 2–4.

An analysis of CErs by country of origin was remarkably consistent across several topic areas and associated sub-questions as shown in Table 3 (Experience of Intelligently Controlled Craft—Not Man-Made), and Table 4 (Anomalous Experiences in the Home). Of the four countries with the largest sample sizes (United States, Canada, Australia, and the United Kingdom), approximately two-thirds (62–73%) reported seeing an intelligently controlled craft. And of this group, 44–52% reported that it hovered, made impossible maneuvers (30–39%), and disappeared quickly (33–42%). Additionally, more than one-third (36–47%) were reportedly seen by multiple observers of sightings of assumed non–man-made craft in these four countries. For the larger samples from these four countries, the characteristics of sightings of craft were also remarkably similar, with no country varying by more than 11% from the average; and in most cases by less than 10%. This implies that the experience of sighting these different craft is remarkably consistent across countries with larger sample sizes. Additionally, 64% (N = 993) of 1,556 subjects responded "yes" to the question: "Was there some kind of craft/ship

TABLE 2
The Number and Percent of Subjects by Country of Origin

Country	Number of Respondents	Percent of Sample*
United States	2,088	64.1%
Canada	273	8.4%
Australia	271	8.3%
United Kingdom	235	7.2%
New Zealand	30	0.9%
Germany	25	0.8%
Ireland	22	0.7%
Denmark	16	0.5%
Mexico	16	0.5%
Netherlands	16	0.5%
Other countries (n = 84)	264	8.1%
Total	3,256	100.0%

* The country sample sizes were used as a baseline in calculating percent answering "Yes."

associated with the CE?" From this sample, the most common UAP shape reported was "circular" (70%), followed by "triangle" (36%), "oval" (34%), "cylindrical/cigar" (28%), and "cloud-like" (22%).

The occurrence of reported anomalous experiences showed that for the four largest country samples, the greatest difference of any country from the country average for a given type of phenomenon experienced is only about 10% (Table 4). For example, telepathic messages (52–58%), electrical appliance malfunctions (45–55%), "missing time" (40–48%), and strange lights in their home (36–48%) were the most frequently reported anomalous experiences. The results from the remaining countries were also very similar to those reported by subjects from the four countries with the

TABLE 3
The Percent Responding "Yes" to Various Experiences with Intelligently Controlled Craft ("Not Man-Made") Reported by Subject Country of Origin

Country	See intelligently controlled craft?	Did it stay still and/or hover?	Did it make impossible maneuvers?	Did it disappear quickly?	None of the above	Multiple witnesses?	Number in country
United States	73%	52%	39%	42%	9%	47%	2088
Canada	62%	44%	32%	33%	11%	36%	273
Australia	68%	45%	38%	42%	5%	41%	271
United Kingdom	65%	46%	30%	35%	9%	38%	235
New Zealand	70%	47%	27%	47%	10%	20%	30
Germany	40%	16%	4%	8%	16%	24%	25
Ireland	68%	23%	18%	23%	32%	41%	22
Denmark	69%	38%	50%	44%	13%	56%	16
Mexico	75%	44%	38%	38%	6%	69%	16
Netherlands	75%	63%	31%	44%	0%	38%	16
Other countries ($n = 84$)	57%	37%	30%	33%	11%	36%	264
Average of Countries (Average of Rows above)	66%	41%	31%	35%	11%	40%	

TABLE 4
Anomalous Experiences in the Home Reported by Subject's Country of Origin (Percent Reporting "Yes")

	Do watches malfunction or stop when you wear them?	Have electrical appliances such as computers malfunctioned around you?	Have you experienced any "missing time"?	Have you experienced any "extra time"?	Have you awakened in a different location?	Have you awakened in a strange position in your bed?	Were you fully awake and suddenly found yourself in a new location?	Have you awakened to find clothing missing or arranged ifferently?	Have you heard telepathic messages?	Have you seen strange lights in your home with no known source?
United States	30%	54%	48%	29%	22%	35%	18%	17%	58%	48%
Canada	22%	45%	40%	24%	16%	27%	11%	10%	52%	36%
Australia	30%	55%	45%	27%	13%	38%	15%	14%	58%	47%
United Kingdom	24%	53%	44%	27%	16%	34%	14%	14%	55%	46%
New Zealand	27%	47%	43%	27%	10%	20%	17%	17%	53%	57%
Germany	20%	32%	32%	8%	8%	16%	4%	0%	48%	24%
Ireland	27%	36%	27%	32%	18%	36%	23%	9%	41%	32%
Denmark	25%	63%	56%	31%	13%	44%	19%	19%	31%	50%
Mexico	38%	50%	56%	31%	19%	44%	6%	19%	63%	56%
Netherland	31%	44%	44%	25%	25%	31%	19%	31%	63%	50%
Other countries ($n = 84$)	29%	50%	44%	34%	20%	34%	18%	12%	53%	41%
Average of countries (average of rows above)	28%	48%	44%	27%	16%	33%	15%	15%	52%	44%

largest sample sizes. Again, this implies a very small difference if cultures were influencing the kinds of experiences people have.

Figure 1 indicates that slightly more than half (53–61% of $N = 2,430$) of the subjects from the four largest country samples believe they observed an NHI being. Approximately one-fourth were "not sure" and less than 15–17% did not observe an NHI being. The percent of people who reported having seen an NHI, were not sure, or did not see an NHI, varied by no more than 8% across the largest country samples. The reported frequency of subjects who reported having seen or interacted with the NHI entity was also remarkably consistent across the four larger country samples. Approximately one-half of this sample ($N = 1,316$), and of the total population ($N = 1,670$) who reported the number of interactions with an NHI, claimed to have interacted 11 or more times, ~15% between 5–10 times, and ~30% just once. Similar results were also found in response to the question "How many times have you interacted with this [non visible] non-human intelligent entity?" The percentage of subjects who reported having interacted "more than 20 times" with an NHI being by age was approximately 50% for each decade between 25 to 74 years. The youngest age group (18–24 years) reported the least (27%) and those 75 and older the most (78%).

The number and percent of subjects who reported having conscious memories of being on board a UAP craft by country of origin was also remarkablly consistent across respondents among the four countries with the largest samples. More specifically, approximately one-fourth (range of 20–29%) of the sample from these countries ($N = 2,368$ or 88.9% of total population) reported conscious recall of being on board a UAP craft, whereas a slight majority (53–62%) of subjects reported "not" having conscious memories of this experience.

The results for conscious memories of being on board a UAP craft were also similar for race/ethnicity and gender. Conscious memory of being on board a UAP craft fell within a relatively small range of 20–32% for all racial/ethnic categories and combinations except those who checked both Hispanic/Latino and American Indian/Alaska Native. Of all ethnic/racial categories, about one-fourth (24%) of the White/Caucasian group ($N = 2,097$; 79.9% of all respondents) reported having conscious memories of being on board a UAP craft. Approximately one-half to two-thirds (range = 48–68%) of subjects across all ethnic categories did not have conscious recall of this event. Further, about one-fourth of females (27% or $N = 1,512$) and males (23% or $N = 1,152$) reported having conscious memories of being on board a UAP craft.

The "type of being" most commonly reported by subjects claiming to have conscious recall of being on board a UAP craft is shown in Figure 2

PANEL A	Number Responding	Response Rate for Question
United States	1811	87%
Canada	213	78%
Australia	224	83%
United Kingdom	182	77%
New Zealand	24	80%
Germany	15	60%
Ireland	14	64%
Denmark	13	81%
Mexico	13	81%
Netherlands	14	88%
Other countries (n=84)	214	81%

PANEL B

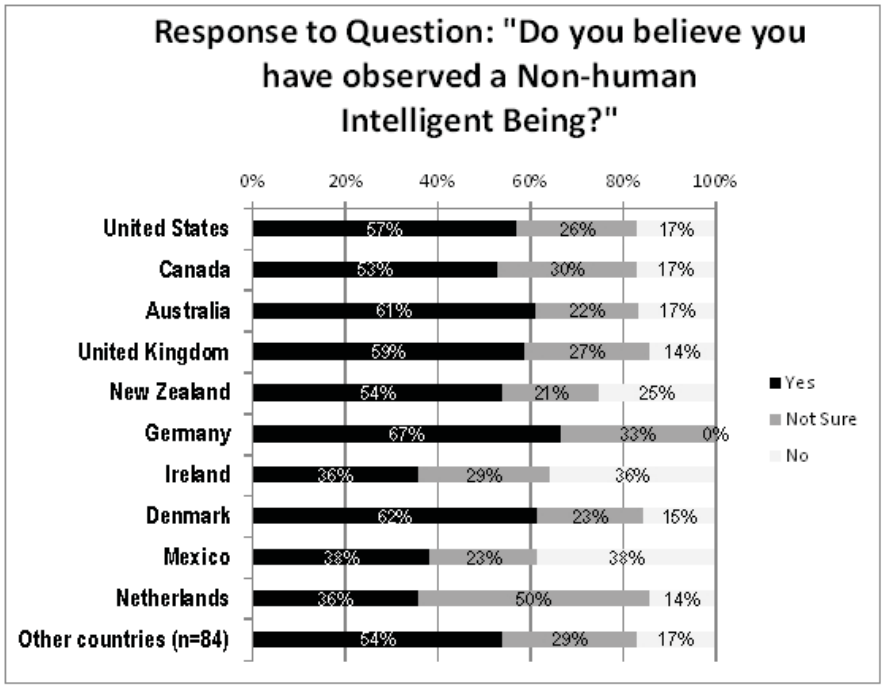

Figure 1. A breakdown of subject's country of origin response to the question: "Do you believe you have observed a non-human intelligent entity"? (A) illustrates the number and percent of subjects responding, and (B) represents the actual response ("yes," "not sure," and "no,") by country of origin to this question.

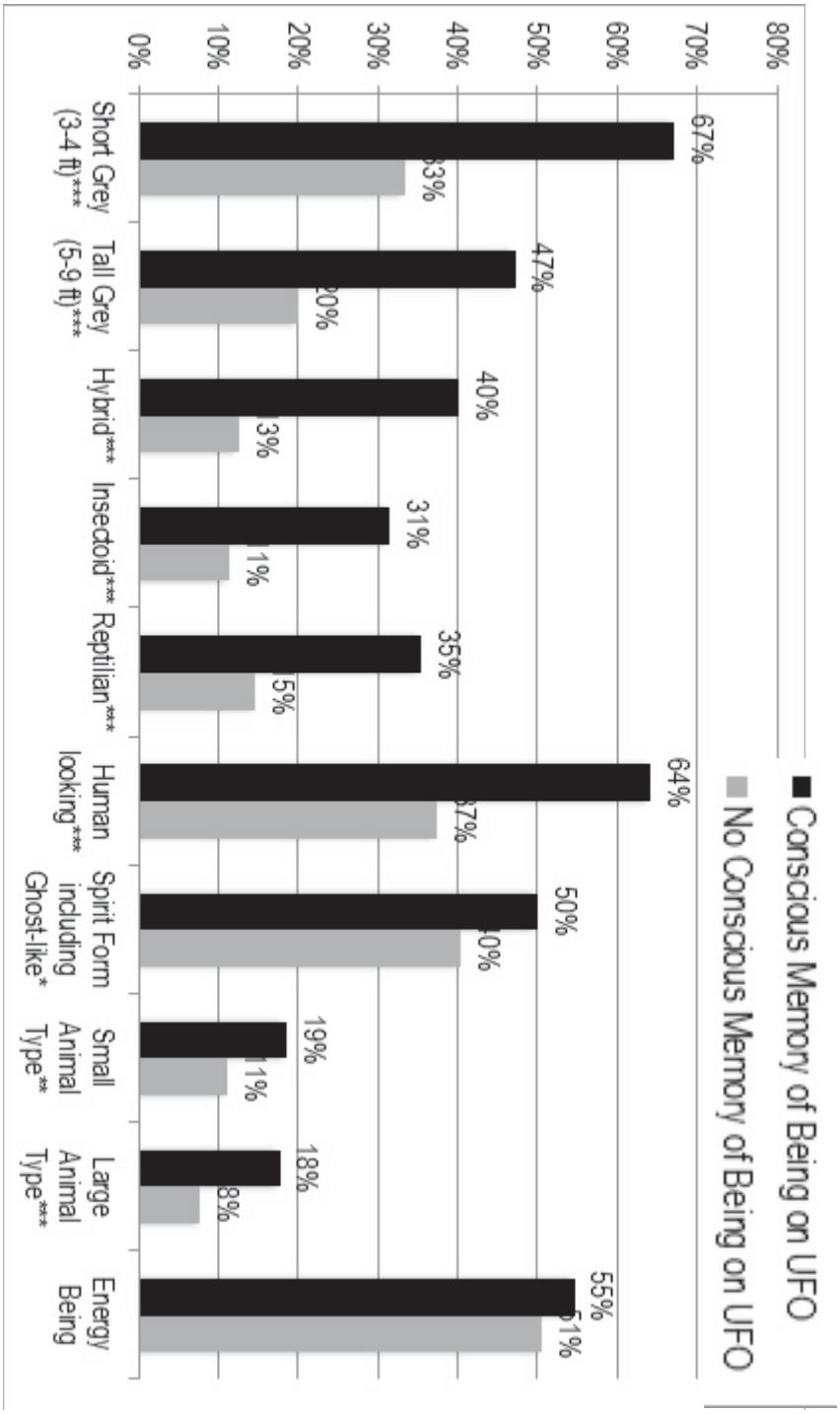

Figure 2. Types of beings encountered by those with conscious recall (*N* = 604) of being on board a UAP craft versus those with no recall (*N* = 668). ***chi -square for difference is significant, $p < .001$; **chi -square for difference is significant $p < .003$; *chi -square for difference is significant, $p < .007$.

as follows: 1) short grey (67%), 2) human-looking (64%), 3) energy being (55%), 4) spirit form including ghost-like (50%), 4) tall grey (47%), and 5) hybrid (40%). Subjects reporting having had "conscious memory of being on board a UAP craft," as opposed to those who had "no conscious memories" of such an experience, were more likely to report seeing one of many different types of beings. What is especially interesting is that the non-physical being in the form of a "spirit" or "energy being" was relatively more common (~50%) and similar (4–10%) between those who report either a conscious or non-conscious recall of their CE with an NHI on board a UAP craft. This finding supports the unique attribute of the CE being associated more often with a non-physical NHI regardless of one's conscious state.

The Behavioral Outcomes Resulting from a Reported Contact Experience with Non-Human Intelligent Beings

A key finding of the FREE study was that the contact experience for most people, contrary to popular movie accounts of unpleasant "abductions" and medical experiments, was predominantly positive (Figure 3). This finding is consistent across almost all country samples, with roughly two-thirds of respondents of the four largest country samples reporting "Highly Positive" or "Slightly Positive" life changes resulting from contact. The number and percentage of subjects by race/ethnicity responding to this same question indicated that for all racial/ethnic categories and combinations, all were in the range of 61–86% positive in their rating of the positivity of impact of CE upon their life.

Approximately one-half to three-quarters (50–84%) of the subjects for each age category shown reported their CE as "Mainly Positive" as a function of age. There was a slight increase in reported positivity as age increased from 18 to 24 (50%, $N = 66$), 25 to 54 (61%, $N = 942$), to 55 and older (78%, $N = 669$). The reported CE also had a similar effect on changing one's life by gender. For instance, 66% ($N = 1{,}016$) of females and 62% ($N = 729$) males claimed to have been changed in a "positive" way, whereas only 13% females and 12% males considered their CE as changing their life in a "negative way." The increase in positivity in older CErs may be associated with the finding that this age group reported having had more frequent CEs than younger groups. This possibility is evidenced in Figure 4 which illustrates the significant relationship ($F = 9.03$, $p < .000$) between the frequency of reported interactions with an NHI and the subjects' ($N = 1{,}670$) responses to the impact of their CEs on "changing their life in a negative, neutral, or positive way." This result indicates a significant positive impact upon positivity of life changes with approximately one-

PANEL A	Number Reporting	Response Rate for Question
United States	1,186	57%
Canada	125	46%
Australia	131	48%
United Kingdom	107	46%
New Zealand	13	43%
Germany	7	28%
Ireland	7	32%
Denmark	3	19%
Mexico	10	63%
Netherlands	9	56%
Other countries (n=84)	143	54%
Total	1,741	53%

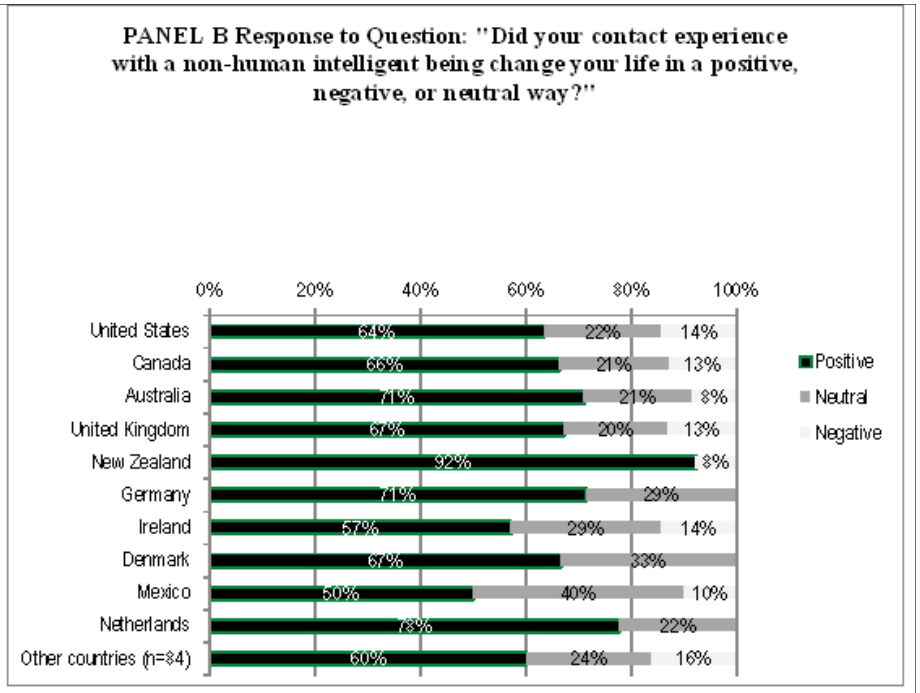

Figure 3. The type, number, and percentage of subjects by country of origin responding to the question "Did your contact experience with a non-human intelligent being change your life in a positive, negative, or neutral way?" Positive Effect = Percent responding "Highly Positive" or "Slightly Positive." Neutral Effect = Percent responding "Neutral." Negative Effect = Percent responding "Highly Negative" or "Slightly Negative." (A) illustrates # and % rate for subjects responding by country of origin, (B) represents the type of response to the question by subject country of origin.

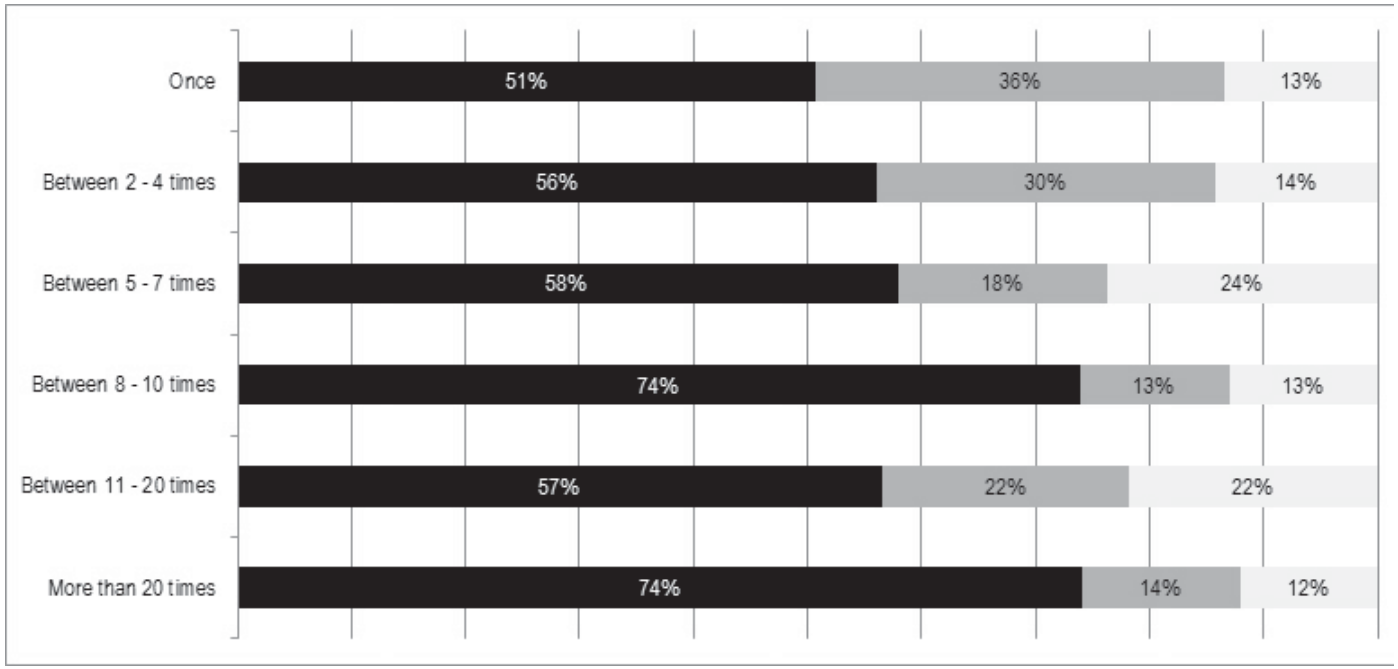

Figure 4. The relationship between the frequency of reported interactions with a non-human intelligence and the subject's (*N* = 1,670) response to the impact of their contact experience(s) on "changing their life in a negative, neutral, or positive way." 1) Frequency of interaction with non-human intelligence has a positive impact upon positivity of life change ($F = 9.03$, $p < .0000$). 2) "Positive Effect" = percent responding "Highly Positive" or "Slightly Positive." Neutral Effect = Percent responding "Neutral." Negative Effect = Percent responding "Highly Negative" or "Slightly Negative."

half to three-fourths of the subjects reporting that their interaction(s) with an NHI had a "positive impact" and only 15–20% reporting a "negative impact." Those groups reporting more frequent interactions (e.g., 8–10 and more than 20 times) were more likely (~15–20%) to report a "positive impact" than for those reporting fewer interactions (e.g., once, and between two to seven times). About half (50.4%) of the respondents indicated that they had interacted more than 20 times with an NHI, and of this group 53% (N = 1,001) were female and 46% (N = 669) male.

The impact of those who report conscious (N = 455) and no conscious (N = 1,012) memories (total N = 1,725) of being on board a UAP and changes in their life showed some tendency for conscious recall (71%, N = 455), as opposed to no conscious (61%, N = 1,012) recall, and the result of greater positivity about their CEs (F = 4.58, p = .0103). In contrast, only approximately 15% of the subjects who had either conscious or no conscious recall of their CE reported having their life changed in a negative way.

The results in Figure 5 represent a comparison of the type of reported first and last few CEs associated with being on board a UAP craft [i.e. a) "More egalitarian"—being treated as more of an equal; b) "Abduction with permission and compassion"; and c) "More negative-like abduction"] as a function of those who claimed to have had either a "conscious" or "no conscious" memory recall of being on board a UAP craft. During the first few encounters, the CE group with conscious recall of being on board a UAP fell into two distinct categories: a) those with more positive, egalitarian experiences (47%, N = 209), and b) those with more negative, abduction-like encounters (42%, N = 186). In contrast, the CE group with no conscious recall of being on board a craft had significantly more positive, egalitarian experiences during their first few encounters (t = 2.8503, p = .004) than the CE group with conscious recall. However, both groups reported similar positive, egalitarian experiences (N = 71%) in their last few encounters (t = .871, p = .383). Interestingly, the percentage of subjects with conscious recall of their "abduction" on board a UAP craft reported a more positive, egalitarian experience in their last few (71%) than first few (47%) CEs. This finding suggests a type of integrated adaptation of their CE which manifests in a reported increase (24%) in their positive viewpoint of their CE over time. Collectively, therefore, it appears that approximately three-quarters of those who have had a CE consider themselves "contactees" ("more egalitarian"—being treated as more of an "equal"). In contrast, ~10% of those who report having had a CE considered it an "abduction with permission and compassion" and ~20% felt it to be a "more negative-like abduction." Despite traditionally held beliefs, these results suggest that even individuals who report having been "abducted" consider themselves "contactees."

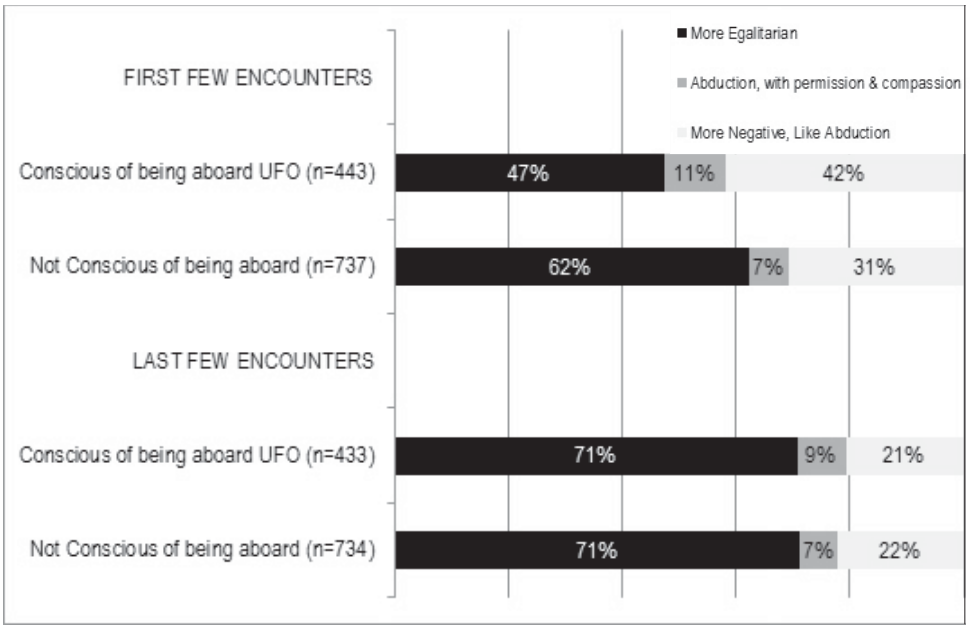

Figure 5. The difference in encounter experience between those with conscious (*N* = 443) and no conscious (*N* = 737) memories of being on board a UAP craft for the first and last few encounters. Subjects were asked to identify their type of experience among different types of encounter experiences included in the following: 1) "More Egalitarian" = percent responding "Being a "Contactee" or "Experiencer" (treating you as more of an equal) plus percent responding "Being a conscious contactee"; "conscious, cooperative, egalitarian and collegial": 2) "Abduction with permission and compassion" = percent responding "Case of Abduction": seeking permission, explaining, more compassionate," and 3) "More Negative-Like Abduction" = percent responding "Case of Abduction"; "Milder, slightly more caring" plus percent responding "Case of Abduction," most negative kind." The difference for Conscious versus Non-Conscious groups was significant for First Few Encounters (t = 2.8503; p = .004), but not for the Last Few Encounters (t = .871; p = .383).

An analysis of the CErs' responses to the question, "How would you describe your experiences with these entities?" indicated that the type of NHI being most likely to facilitate a "positive" response was the "Human Looking" (N = 903, 60% positive and 5% negative) and "Hybrid" (N = 669, 43% positive and 6% negative). In contrast, the "Reptilian" was considered the least positive and most negative (N = 554, 16% positive and 23% negative) of all NHI beings experienced. This outcome may be related to the physical appearance of the being encountered.

The Comparison of Out-of-Body and Near-Death Experiencers in Terms of Their Overall Emotional Evaluative Response (Positivity Index) Resulting from Contact Experiences

Since an OBE and an NDE have been documented to facilitate positive after-effects on personal viewpoints and values (Ring 1984, Long 2011, Morse & Perry 1994), we attempted to minimize potential sampling bias of such outcomes on positivity-related attributes in our study. It should be noted, however, that since the criteria for an OBE and an NDE were not fully delineated in our survey, their incidence and analyses may not be accurate since each are difficult to verify solely on the basis of their "yes" response. Despite this limitation, a measure of positivity of the subject's "overall emotional evaluative response" resulting from their CEs in those who also have had an OBE or NDE is shown in Figure 6A and Figure 6B, respectively. This overall measure of positivity (Positivity Index) was constructed for use in correlational analyses using four Phase 2 response items (Alpha = .805) as follows:

1. Did your Contact Experience change your life in a Negative or a Positive way? How much?
2. Please provide an overall emotional evaluative response to your Contact Experience.
3. How would you characterize your first few initial Extraterrestrial Encounter Experiences? What were your initial beliefs about your experiences?
4. How would you characterize your last few Extraterrestrial Encounter Experiences? What are your beliefs now about your experiences?

Since the question "Please provide an overall emotional evaluative response to your Contact Experience" had the highest item-scale correlation (r = .679), this item was used as a surrogate for the Positivity Index in subsequent analyses for simplicity sake. As such, approximately two-thirds of the subjects reported having had a positive effect in terms of their overall emotional evaluative response resulting from their CE. Approximately 15% or less reported that their CE, with or without an OBE or an NDE, had a negative effect in this regard. A small 9% increase in positivity was seen for subjects who had both an OBE and a CE (71% of N = 1,103) versus a CE and no OBE (62% of N = 268). In contrast, there was no difference in the overall emotional evaluative response for subjects who had both an NDE and a CE (70% of N = 505) versus a CE without an NDE (70% of N = 822). Most respondents were positive about their CE whether or not

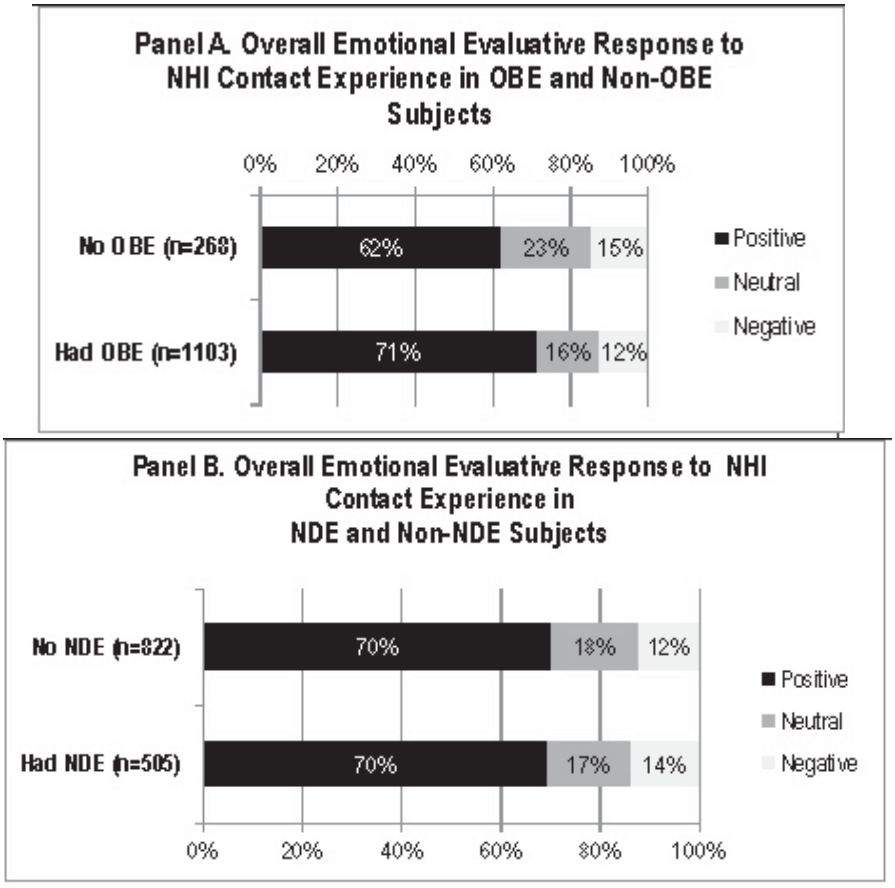

Figure 6. Comparison of OBE (A) and NDE (B) experiencers in terms of their overall emotional evaluative response resulting from contact experience. Positive = percent responding "Most positive emotional experiences in your life" or "Mostly positive emotional experiences," Neutral = percent responding "Average emotional experiences," and Negative = percent responding "Most negative emotional experiences in your life" or "Mostly negative." The questions asking about positivity of experience used a 5-point scale (i.e. a rating of 4 and 5 are combined as "Positive," a rating of 3 is considered "Neutral," and a rating of 1 or 2 is scored as "Negative").

they had an OBE or an NDE. Consequently, the effect of an OBE or an NDE in those reporting a CE had a minimal effect, if any, on positivity of their emotional evaluative response. Further, the presence of a prior OBE or NDE had little if any potentiation effect on the positivity results. The increase in positivity resulting from having an OBE or NDE plus a CE versus just a CE alone did not exceed 9% for the OBE and 7% for the NDE

TABLE 5
Items Showing Largest Attitude Change among Those Who Responded "More Than 10 Times" to the Question: How many times have you had this type of contact without a non-human intelligent being physically present?

	Favorable	Neutral	Unfavorable	Number Responding	Response Rate
My understanding of myself	90%	9%	1%	500	85%
My understanding of "What is Life all about"	87%	10%	2%	500	85%
My interest in self-understanding	87%	13%	0%	503	86%
My concern with the welfare of the planet Earth	87%	12%	1%	502	86%
My desire to achieve a higher consciousness	86%	13%	0%	502	86%
My concern with spiritual matters	86%	13%	1%	501	86%
My Spiritual feelings	85%	13%	2%	500	85%
My insight into the problems of others	84%	15%	1%	499	85%
My appreciation of nature	84%	16%	0%	502	86%
My understanding of others	83%	16%	2%	502	86%
My personal sense of "Purpose in Life"	83%	14%	3%	499	85%
My sense that there is some inner meaning to my life	82%	16%	2%	501	86%
My interest in psychic phenomena	82%	17%	1%	500	85%
My interest in the possibility of Extraterrestrial life	82%	18%	1%	502	86%
My compassion for others	82%	16%	2%	499	85%
My sense of the sacred aspect of life	80%	18%	2%	499	85%
My concern with Ecological matters	80%	18%	2%	503	86%

Percent Favorable = percent responding "Strongly Increased" or "Increased Somewhat"
Percent Neutral = percent responding "Had Not Changed"
Percent Unfavorable = percent responding "Decreased Somewhat" or "Strongly Decreased."

TABLE 6
Items Showing Largest Attitude Change Among Those Who Responded "More Than 10 Times" to the Question: How many times have you had this type of contact with an NHI Physically Present?

	Favorable	Neutral	Unfavorable	Number Responding	Response Rate
My interest in self-understanding	86%	14%	1%	200	85%
My appreciation of nature	85%	15%	0%	202	86%
My concern with the welfare of the planet Earth	85%	14%	1%	200	85%
My understanding of myself	84%	13%	3%	198	84%
My interest in the possibility of Extraterrestrial life	83%	17%	1%	200	85%
My sense that there is some inner meaning to my life	81%	17%	2%	199	84%
My understanding of "What is Life all about"	81%	15%	4%	198	84%
My interest in psychic phenomena	81%	19%	0%	201	85%
My Spiritual feelings	80%	16%	4%	202	86%
My concern with spiritual matters	80%	17%	3%	201	85%
My desire to achieve a higher consciousness	80%	19%	1%	201	85%

Favorable = percent responding "Strongly Increased" or "Increased Somewhat"
Neutral = percent responding "Had Not Changed"
Unfavorable = percent responding "Decreased Somewhat" or "Strongly Decreased"

group comparisons. Consequently, the CE alone, which resulted in a largely positive impact in the majority of subjects in this study, suggests that the CE is generally positive for those who either have had or not had an OBE or NDE. Consequently, an NDE or OBE makes virtually no difference on positivity measures.

What is especially interesting is that a very large percentage of the study sample (80.4% of $N = 1,381$) reported having had an OBE as part of the CE. Given that only about 10% of all people in the U.S. report having had at least one OBE in their lifetime, this unusually high incidence of OBEs associated with a CE provokes further questions of the phenomenon's influence on the psychological state of the individual, and the potential nature of the phenomenon itself (Terhune 2009).

Analysis of Reported Attitude Change Resulting from Contact Experience

The positive attitude analyses for items showing the greatest increase (>80%; $N = 499–503$) in respondents with "More than 10" CEs of both a nonphysical (without an NHI present) and physical (with an NHI present) nature are represented in Table 5 and Table 6, respectively. The specific attitudes showing reported positive change ("strongly increased" or "increased somewhat") were similar for both the nonphysical and physical CErs. This included matters of insights associated with understanding oneself and others, life, concern for the planet, spiritual concerns, psychic phenomena, and achieving a higher consciousness, among others.

Response items correlating (Pearson) most highly with an increase in positivity (average N for correlations = 1,490) to the four-item "positivity index" (Alpha = 0.805) included an increase in feelings of "self-worth;" sense of "purpose and meaning of life;" and ability to love others in an impersonal way, among others. This outcome was reinforced in a stepwise regression of attitude-change items with the positivity index as the dependent variable. More specifically, the item "My feeling of self-worth" was found to both best predict the positivity index (12.2% of variance explained) and to correlate most highly with the positivity index ($r = 0.383$). The similarity of these statistical results reinforces the finding that the CErs have a distinct and largely positive outcome in their perception of themselves and others.

Using the positivity index, a comparison of "positive" outcomes indicated that a non-physical (without an NHI physically present) CE facilitates a more positive outcome than the physical kind (NHI physically present) for those reporting more than 10 CEs. Moreover, this increased sense of "positivity" was reflected in the comparatively larger percentage of subjects who reported more than 10 CEs with a non-physical (81%: $N = 485$) than a physical 68% ($N = 196$) NHI. Apparently, frequent CEs with either a physical or non-physical NHI facilitates a dramatic increase in many attributes and viewpoints that seem to alter one's perspectives on life and oneself. Based on such reported psycho-spiritual outcomes, the question remains as to what specific characteristic of the CE serves to trigger an increase in one's appreciation of life and concern for the welfare of others.

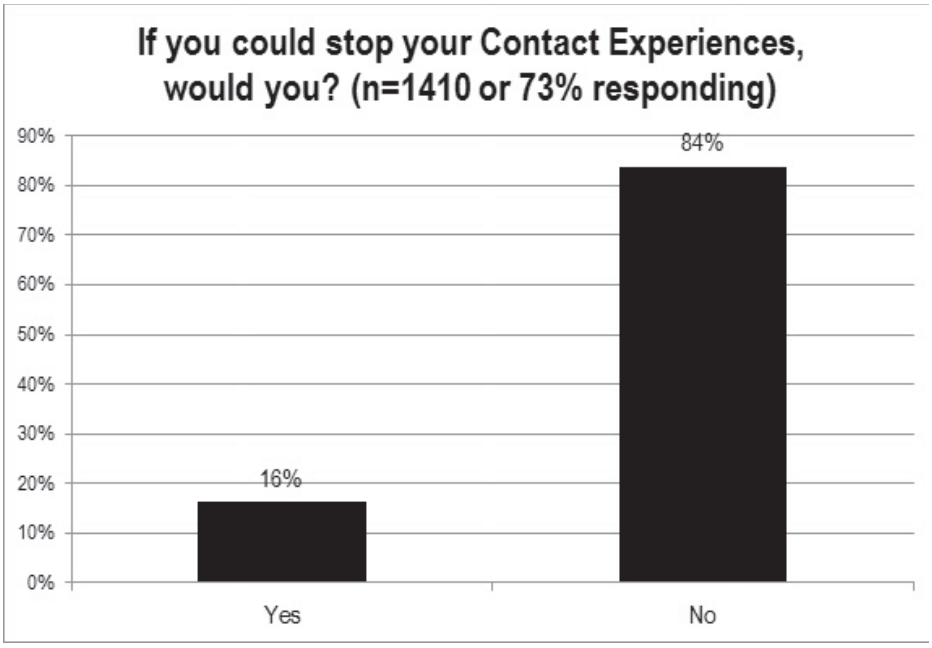

Figure 7. Subject responses (*N* = 1,410 or 73% responding) to the survey question: "If you could stop your contact experience, would you?"

The positive outcomes measured using the "positivity index" (Table 5) likely contributed to the result in Figure 7 that indicated that of 1,919 subjects, 84% reported that they did "Not" want their CEs to end. This dramatic outcome was reinforced by the result that the majority of subjects (60%, $N = 609$) who claimed to have been "taken and relocated to another location" also did not want their CE to end. This result was supported in another study ($N = 10$) by McNally (2012) who concluded that "on balance" 90% of his study sample reported that they were "glad to have been abducted." Despite the large difference in sample sizes, McNally's conclusion is consistent with the FREE result that 84% of a large population sample did not want their CE to end.

Contact Experience in a Matrix Reality

An analysis of CE in a "matrix reality" (MR) shown in Table 7 was performed since a much larger population of CErs reported a positive attitude change resulting from a non-physical ($N = \sim500$) rather than from a physical ($N = \sim100$) nature experience. An MR was defined for the respondents as follows:

TABLE 7

The Subject Responses for Individuals Who Reported to Have: 1) "Met an NHI Being in a Matrix Reality", 2) More than Ten Contact Experiences of a Non-Physical Nature, and for Whom, 3) the Matrix Realtiy Was as "Real as Talking with a Family Member". 34% ($N = 655$) of Phase 2 Respondents Met These Criteria

				Responded
Did this NHI contact experience happen when you were physically in your body?	Yes, 53%	No, 47%		612
Was your consciousness separated from your body at the time of the NHI contact experience?	Yes, 79%	No, 21%		615
While in this "Matrix"-like type of reality, were your thoughts sped up?	No, 39%	Faster than usual, 32%	Incredibly fast, 29%	609
While in this "Matrix"-like type of reality, were your senses more vivid than usual?	No, 18%	More vivid, 40%	Incredibly more vivid, 42%	614
While in this "Matrix"-like type of reality, did you feel separated from your body? For example, I lost awareness of my body, I clearly left my body and existed outside it.	Yes, 60%	No, 16%	Not sure, 24%	637
While in this "Matrix"-like type of reality, did you have a feeling of peace or pleasantness?	No, 22%	Relief or calmness, 29%	Incredible peace or pleasantness, 49%	631
While in this "Matrix"-like type of reality, did you see or feel surrounded by a brilliant light?	No, 45%	An unusually bright light, 13%	A light clearly of mystical or other-worldly origin, 42%	618
While in this "Matrix"-like type of reality, did you seem to encounter a mystical being or presence, or hear an unidentifiable voice?	No, 16%	I sensed their presence, 37%	I actually saw this being, 47%	634
While in this "Matrix"-like type of reality, did you see deceased or religious spirits?	No, 61%	I sensed their presence, 12%	I actually saw this being or beings, 27%	630
While in this "Matrix"-like type of reality, did you seem to enter some other, unearthly world?	No, 23%	Some unfamiliar and strange place, 31%	A clearly mystical or unearthly realm, 47%	625
While in this "Matrix"-like type of reality, did time seem to speed up or slow down?	Time seemed to go faster or slower than usual, 10%	Everything seemed to be happening at once, 15%	Time stopped or lost all meaning, 55%	625
While in this "Matrix"-like type of reality, did you feel a sense of harmony or unity with the universe?	No, 25%	I felt no longer in conflict with nature, 14%	I felt united or one with the world, 61%	619
While in this "Matrix"-like type of reality, did you suddenly seem to understand everything?	No, 35%	Everything about myself or others, 22%	Everything about the universe, 43%	622
In this "Matrix"-like type of reality, did you perceive that Time did not exist?	Yes, 79%	No, 21%		621

> Not in a 3-Dimensional reality, i.e. you were not in a perceived physical location such as on earth, on a planet, or ship, etc., but instead you perceived yourself in a "Matrix" type of reality (a reality with no boundaries, similar to like you are in the middle of outer space).

Additional criteria for subject inclusion comprised the following: 1) frequent CErs (>10 times) whose responses were considered more reliable than those who had fewer CEs; 2) CErs who responded "yes" to the questions: a) "Did you ever have an NHI CE not in a 3-dimensional reality, and b) for whom the matrix reality was as "real as talking with a family member."

Of the 35% (N = 655) of Phase 2 respondents who met these criteria, approximately three-quarters to two-thirds of the subjects responded "yes" to the diverse range of the following: 1) an altered sense of reality (e.g., consciousness leaving the body; losing body awareness; entering an "unearthly world", a feeling of "harmony with the universe"; and "understood everything"), and 2) perception (senses more vivid; absence of time, or that time sped up or slowed down, and thoughts sped up). Approximately one-half to one-quarter reported seeing a bright light; encountering a mystical being or presence or hearing an unidentifiable voice; seeing deceased or religious spirits; and an incredible feeling of peace or pleasantness. Approximately 80% also claimed that their consciousness was separated from their body and 72% experienced a sense of "expanded consciousness" in the presence of the NHI at the time of the CE. What is especially interesting is the finding that reports of perceptions of alternate realities/dimensions, OBEs, perceived dimensions/alternate realities, and past-life experiences, were more frequent in occurrence than reports of having been physically "abducted" and brought to a craft. In fact, only approximately one-fourth or fewer of the subjects claimed to have conscious recall of being on board a UAP craft and physically interacting with an NHI.

Subjects who reported having had an OBE or NDE were also much more likely to have had CEs in an MR. There was a significant effect (chi-square $p < .0001$), for example, for those having an OBE and meeting an NHI in an MR (68%; N = 702) than meeting an NHI in a non-MR (24%; N = 611). A similar result was observed for those having had an NDE and meeting an NHI in an MR (44%; N = 732) than meeting an NHI in a non-MR (30%; N = 701). While the likelihood of reporting an NHI was significantly greater for those who reported either an OBE or an NDE in an MR than in a non-MR, the percent difference was much greater for the OBE (44%) than for the NDE (14%) group.

TABLE 8
Information Reported Received during a Contact Experience. Items Ranked by Percent for Subjects (*N* = 1,184) Answering "Yes" to the Question: "Did you receive any type of communication from a non-human intelligence?"

	Percent Responded "Yes"	Percent Responded "No"	Missing	Number Responding
Can the NHIs travel to other dimensions?	97%	3%	208	976
Can the NHIs travel to the future?	85%	15%	377	807
Can the NHIs travel to both the past and also to the future?	84%	16%	373	811
Can the NHIs travel to the past?	83%	17%	377	807
Did the NHIs impart reassuring messages to you?	67%	33%	113	1071
Did the NHIs provide you with a spiritual message?	59%	41%	111	1073
Did the NHIs give you a message of Love or of Oneness?	59%	41%	96	1088
Did the NHIs ever tell you about the concept of Parallel Universes (many universes)?	36%	64%	128	1056
Did you ever call down a UAP craft?	35%	65%	112	1072
Did the NHIs ever tell you about the concept of "Time"?	35%	65%	113	1071
Did the NHIs give you any message about God or a Creator?	34%	66%	113	1071
Did the NHIs tell you of your mission here on Earth?	34%	66%	110	1074

Communication Received During Contact Experience

An often-ignored aspect of the CE pertains to reported communications with NHI beings. Table 8 illustrates, for instance, that an overwhelming majority of the subjects (>83%: $N = 1{,}184$) who responded "yes" to the question: "Did you receive any type of communication from an NHI?" claimed that the NHI had the ability to travel to another dimension and/or time (past or future), and more than half reported having received "reassuring messages" (67%), a "spiritual message" (59%), and/or a "message of Love or of Oneness" (59%). Additionally, approximately one-third contend to have received information regarding parallel universes, the concept of time, and messages about God or a Creator. Of this group, 37% ($N = 438$) claimed that the communication was "two-way using telepathy" (NHI present) and 34% ($N = 402$) reported it as "non-physical thought/voice downloaded from an NHI to a human" (NHI not present). Sixty percent ($N = 710$) also reported having received telepathic messages on more than five occasions.

The positivity index was also found to correlate most strongly with the message of "Love or of Oneness" incurred during their CE. This result was further reinforced by a stepwise regression which indicated that this message accounted for the greatest percent of variance ($N = 1{,}014$: 14.9%) in positivity. It is important to note, however, that much of the unaccounted variance in positivity (69.4%) is likely related to personality traits and environment-related factors not specifically addressed in this survey.

Physical Aspects of Being "Abducted" by a Non-Human Intelligence

The incidence of the reported physical characteristics associated with NHI interactions shown in Figure 8 indicate that the majority of subjects (>65%) did not report events and/or experiences typically associated with traditionally held beliefs of the "alien-abduction phenomenon." More specifically, only approximately one-fourth or fewer of the subjects claimed to have conscious recall of the following CEs: 1) subjected to biological examinations while lying on a table, 2) being told about the implantation of a device, and 3) having a fetus removed from their body. The most common (53%) physically related experience reported was the presence of wounds on their skin following their CE.

What may be the most significant type of physical CE outcome was the finding that 50% of 1,465 CErs responded "yes" to the question: "Do you believe that any of these NHIs have performed a medical healing on either you or another member of your family?" This medical outcome was consistent with the findings by Dennett (1996) who reported more than 100 accounts of healings of injuries, illnesses, and diseases performed by an

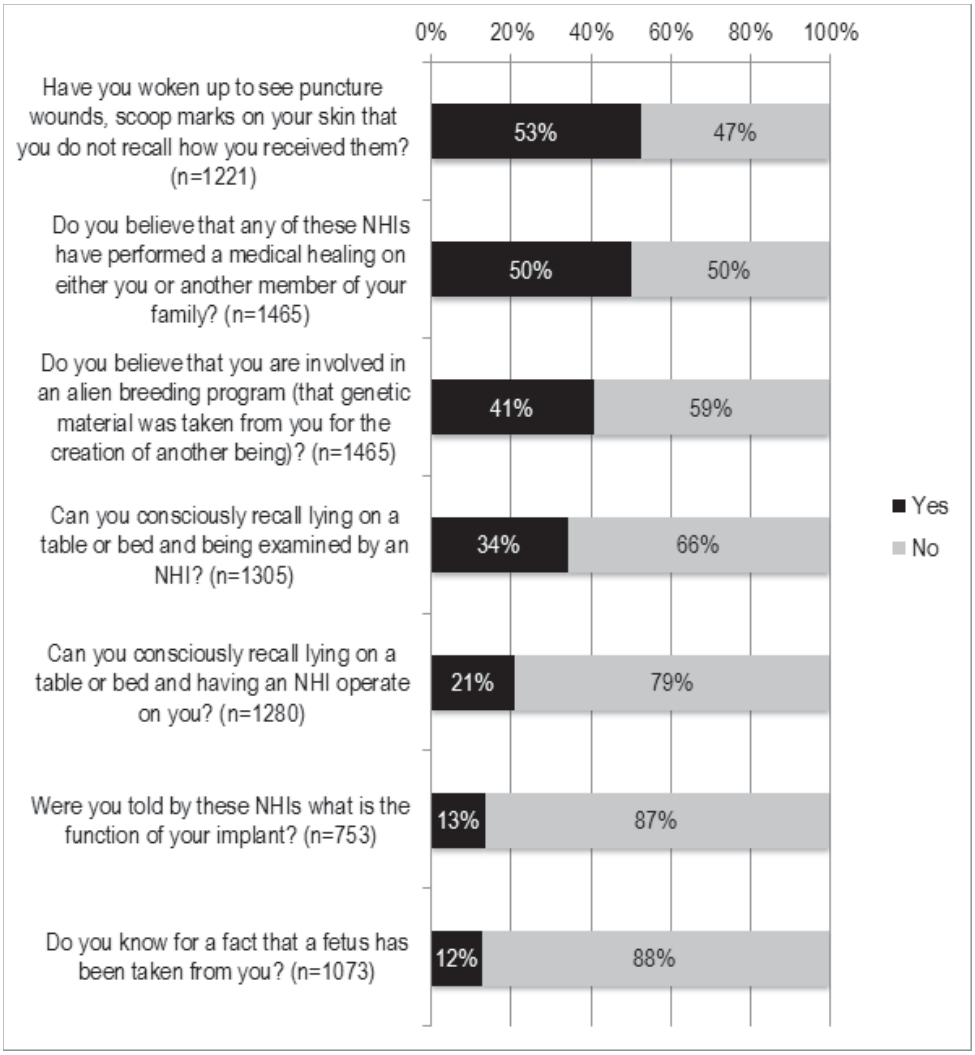

Figure 8. Responses to questions related to physical aspects of being abducted by a non-human intelligent being.

NHI associated with or without a UAP craft. Another surprising outcome was that 41% (N = 1,141) of respondents believed they were "part of an alien breeding program" which included "genetic material being taken" for the "creation of another being." In fact, approximately three-quarters (79%, N = 533) of those participating in this kind of program claimed to have had an alien hybrid child or children.

Comparison of the FREE Study to Prior Investigations

The lack of CE-related research in the literature mitigates any reliable comparative analyses between the FREE and other studies on those who report having had an "alien abduction experience." Comparisons with the few studies in this area by Ring (1984, 1992), Clancy (2005), Marden and Stoner (2012, 2013), and Friedman and Marden (2016) also are not straightforward given the associated methodological differences as follows: 1) the number of subjects (FREE study: N = 3,256 vs. < N = 100); 2) the type, wording, and number of survey questions asked (more than 500 in the FREE study vs. ~50); 3) the state of memory recall (hypnotic regression, lucid dreaming, conscious, and not-conscious, etc.) during the CE; 4) the incidence and type of CEs ("abduction" or "contactee"); and 5) the impact of pre-existing OBE/NDE on the positivity of CErs. Consequently, the comparisons made among the FREE and other study results must be regarded as tenuous and interpreted with caution.

While prior studies have focused on physical-type "Abductions" or individuals who have been taken and relocated on board a UAP craft by so-called "extraterrestrials," the FREE study analyzed those who reported either a physical (abductee) or non-physical (contactee) type CE that may or may not relate to sightings of a UAP. This is represented, in part, by the finding that the majority (~75%) of the FREE study population reported "not" having conscious memories of being on board a UAP craft. Prior studies which have not made this distinction, therefore, may have excluded a certain percentage of CErs who were "contactees" and not "abductees." That is, all prior studies have focused on those who claim to have been physically abducted, whereas the FREE study included subjects who have reported having had both abduction and contactee CEs. Moreover, while most studies have understandably focused on the psychological profile of the CEr noted before the events, very few studies have examined the outcomes facilitated by the CE on their personal viewpoints and values, and characteristics of altered perceptions incurred during their CE.

The most significant comparative psychologically based study of behavioral outcomes facilitated by the CE, to that of the FREE study, was that obtained by psychologist Ring (1992) in CErs who reported either an NDE or UAP. In the Ring study, both the UAP encounter (N = 97) and NDE (N = 74) subject groups manifested very similar behavioral transformations despite their uniquely different experiences. Remarkably, the behavioral outcomes reported by CErs in the FREE study, which showed an increase in social concern, spirituality, appreciation of life, self-worth, compassion toward others, telepathy, and belief in life after death, were similar to those reported in the UAP and NDE groups in the Ring (1992) study. The

reported consistency between the FREE and Ring study subjects support the conclusion by Ring (1992) of a "pervasive pattern of wide-ranging and powerful psychophysical changes following either a UAP abduction or NDE experience." The overarching question is whether or not such insights and beliefs actually represent a greater understanding and true perspective of these extraordinary experiences.

In a questionnaire study to determine common characteristics of the abduction experience, for example, Marden and Stoner (2012) analyzed 50 questions from abduction experiencer (AE) (N = 50) and control non-abduction experiencer (NAE) (N = 25) groups that pertained to the subjects' demographics, memories, and emotional and physiological responses. This study indicated that the vast majority of the AE group was revisited (some more than 10 times) and taken from their homes to an alien craft. In contrast, the FREE study also revealed that it is not uncommon for subjects to report frequent CEs (approximately one-half of the sample of 1,316 subjects interacted 11 or more times). In the Marden and Stoner study, 62% of the AE group stated that they consciously recalled the observation of an NHI immediately prior to an abduction while they were outside their home, and 67% consciously recalled the observation of an "unconventional craft." Similarly, in the FREE study subjects, slightly more than half (53–61% of N = 2,430) claimed to have observed an NHI being, and approximately two-thirds reported seeing an "intelligently controlled craft" which "hovered" (44–52%), made "impossible maneuvers" (30–39%), and "disappeared quickly" (33–42%).

Other similar results reported in both the Marden and Stoner (2012) and FREE study included the following: 1) Forty-three percent (N = 21) of the AE group in the Marden and Stoner (2012) study stated that "witnesses reported the observation of a UAP prior to or during their abduction." In contrast, 41% (N = 2,368) of the FREE subjects reported that the UAP was "not a man-made craft" and seen by multiple observers; 2) Fifty-three percent (21 of 40 subjects) of the AE group believed they felt an alien implant in their body, and 83% stated that they had awoken with unexplained marks on their bodies. Similarly, 52% (N = 1,302) of the FREE subjects believed that an NHI placed a permanent foreign object in their body, and 53% reported having awakened to see puncture wounds or scoop marks on their skin that they could not recall how they received; and 3) The reported experience of telepathic communication associated with the CE was a common result in the Marden and Stoner study (88% of AE group) and the FREE study (55% of N = 2,368).

The most commonly reported types of paranormal anomalous activity associated with the CE in the FREE study (receiving telepathic messages;

malfunctioning electrical appliances; sightings of orbs, ghosts and/or poltergeists; "missing time"; and observing "strange lights in their house with no known source") were surprisingly consistent with Vallee's (1977, 2008) description of the UAP in his "Layer V: Psychic Effects" model:

> Impressions of communication without a direct sensory channel, poltergeist phenomena: motions and sounds without a specific cause, outside the observed presence of a UFO, etc.

Other studies also have reported increased paranormal abilities in the aftermath of an "alien abduction" (Bullard 1994, Ring 1984, 1992), and many report long histories of ostensibly paranormal events preceding their "abduction" experience (Bullard 1987, Randle, Estes, & Cone 1999, Ring 1992). Similarly, 88% (AE Group; $N = 43$) of the subjects in the Marden and Stoner (2012) study reported paranormal activity in their homes (light orbs that dart or float through the air, poltergeist activity such as household items flying through the air, and pictures flying off walls, etc.). This activity was also noted by Hopkins, Jacobs, and Westrum (1992) of CEs associated with a sense of a "strange figure(s) present, missing time, seeing strange balls of light in one's room, and unexplained scars on their body." In fact, one of the major findings in the FREE study was the frequent report by CErs of sightings of orbs, ghosts, and/or poltergeists.

The traditionally held belief that an "abduction"-related CE commonly involves sexual and biological examinations, which may include the removal of a fetus, was evidenced to a lesser extent in the FREE study. That is, approximately one-fourth and fewer of the sample population ($N = 1,224$) reported being subjected to biological examinations (28%), sex (12%), and to "know for a fact that a fetus was taken" from them (12%). Interestingly, however, 41% ($N = 1,141$) of respondents believed they were "part of an alien breeding program" that included "genetic material being taken" for the "creation of another being." Although these physical experiences do seem to occur, their reported incidence appears to be less than that suggested by those who have described a typical abduction as follows: 1) Jacobs (2000) with hypnotized "abductees," described a typical abduction experience as being associated with "harvesting" by which the "alien" causes sexual stimulation prior to an internal procedure to recover an egg or sperm; 2) Newman and Baumeister (1996) reported women having "sexual intercourse with aliens," with some women reporting having had offspring resulting from this act; and 3) Based on an analysis of a sample of 270 abduction reports, Bullard (1987) described the most common features of an "abduction experience" as "capture" (caught and taken aboard a UFO) and "examination" (subjected to physical, sexual, mental, and/or spiritual examinations).

Spiritual, Mystical, and Extraordinary Experiences

Spiritual, mystical, and extraordinary experiences (SMEE), which represent various types of non-ordinary or altered states of consciousness (ASC), and associated encounters with a so-called "supernatural world," have been widely reported throughout human history across cultures. These experiences are often characterized by perceptions of oneness/ interconnectedness with the universe, positive emotions, alterations of spatial and temporal awareness, insight and wisdom, a sense of spirituality, the absence of physical and mental objects of ordinary consciousness, and the compelling sense that the experience feels "real" (Griffiths et al. 2008, Beauregard 2012).

SMEE, which has the potential to dramatically trigger a fragmented self-identity and transcendent experience that can be life-changing, has been elicited in retreat settings (Hood 1975), through meditation (Newberg et al. 2001), under conditions of sensory isolation, with psychedelic drugs (Griffiths et al. 2006, 2008, Hood 2014), and even by non-invasive brain stimulation (Yaden et al. 2015, 2016). These experiences have been shown to occur spontaneously, resulting from brain injuries, exposure to awe-inspiring situations, NDE/OBEs, and even in CEs with or without a UAP interaction. What is especially interesting is that SMEEs also appear to correlate with positive changes in family life, reduced fear of death, and a greater sense of purpose (Koenig, King, & Carson 2012). In fact, the analysis of the diverse range of CEs in the FREE study, which appeared to facilitate similar positive behavioral outcomes in the majority of the population sample, may actually represent a type of SMEE. If such outcomes are indeed valid, then one may speculate that an aspect of consciousness may serve as the fundamental characteristic associated with a diverse range of SMEEs, of which the CE associated with or without a UAP may be a part.

Given this context, a key question pertains to how one can explain aspects of physical and non- physical interactions with NHI beings as reported by CErs in the FREE study, as well as by those who report NDEs and OBEs, among other SMEEs. Many researchers have demonstrated, for instance, that both NDEs (Atwater 2017, Long 2011, Morse 1994, Ring 1984, 1992, 1994) and OBEs (Alegretti 2004, Buhlman 2013, Minero 2012, Monroe 1977) involve contact experiences with NHI beings. Studies have also documented individuals who reported contact with NHI beings while remote viewing (Adams & Luke 2013, Targ 2012) and during hallucinogenic experiences using Dimethyltryptamine (DMT) (Harner 1990, Adams & Luke 2013, Strassman 2001). The behavioral outcomes of subjects in these studies, however, have not been sufficiently analyzed to determine the

similarities and differences, if any, incurred from different SMEEs. When mystical experiences have occurred in experimental settings, whether facilitated by hallucinogenic drugs (Grof 1980, Pahnke & Richards 1966), hypnosis (Cardeña & Beard 1996), meditation, or sensory modification (Masters & Houston 1973), there has been a strong consistency of such experiences on behavioral outcomes which also appear to be similar to those reported in the FREE study population.

Collectively, these studies suggest that an aspect of consciousness may actually represent the key unifying characteristic that explains each distinct CE (i.e. SMEE). In fact, consciousness, which has been acknowledged to affect quantum systems (Dunne & Jahn 1992, Jahn et al. 2000, Radin 2002, 2006, 2008) is largely ignored as a contributing variable for such CEs, despite the fact that many are directly aligned with ASC. The component of consciousness, for instance, was represented in the FREE study as follows: 1) Sixty-seven percent reported that their "consciousness separated from their body" at the time of the CE, and 2) Seventy percent believed they felt a "sense of expanded consciousness" in the presence of NHIs, among others illustrated in Table 7. Alterations in perception, emotion, and attitudes/viewpoints were also a major component of the CE as indicated in Tables 5–7, and Figures 4–7. Interestingly, such changed perceptions and perspectives reported by CErs in this study have also been documented in other studies associated with different types of SMEEs (CErs, NDE, OBE, and DMT, etc.) noted earlier.

Within this context, the consistency of reported CEs, OBE/NDEs, and SMEEs may be critical for understanding a unique aspect of human perception and ASC. Although our current medical and scientific concepts are inadequate to explain all aspects of reported CEs, certain features appear to correspond with some of the basic principles from quantum mechanics, such as non-locality, coherence or interconnectedness, knowledge of existence in another dimension without a body, the perception of time as if the past, present, and future exist simultaneously and instantaneously, and the instantaneous information exchange in a timeless and placeless dimension. This concept may be indirectly supported by the results in this paper and from the broad discipline of SMEEs of subjective reports that "time and space no longer existed," and that it is possible to "see everything at once" and "through any obstacle and in every detail as a holographic view." Consequently, a key question emerges as to whether or not the similarity of such ASC helps facilitate changes in one's personal viewpoints and philosophical values. This notion should be addressed in future studies of CErs with NHI and UAP.

Future Directions

A major goal for researchers should be to establish agreed-upon principles and theories to be tested by recognized scholars among different scientific disciplines, and supported by independent studies to verify research outcomes in the study of CErs associated with and without the UAP. This research mission, however, is impeded by the following: 1) intangible personal accounts serve as the primary source of the CE evidence for study with a paucity of tangible, objective UAP evidence available for study, 2) it lacks a widely accepted theory of its phenomena, 3) research cannot be performed and replicated upon demand or be controlled in a laboratory setting, 4) according to the general scientific community, extraordinary claims made by many UAP researchers have not been sufficiently supported by empirical evidence, and 5) limited progress has been made in understanding the nature and origin of the phenomenon despite many decades of UAP investigations that have focused almost exclusively on the psychology of so-called "alien abductees" and the physical aspects of the phenomenon.

It is very difficult to either reject or confirm any hypothesis since the scientific method and principles routinely applied in research do not easily conform to the anecdotal testimony of reported CEs. Consequently, the FREE study results cannot be sufficiently explained and confirmed at the present time. Despite this lack of validation, the similarity of reported psycho-spiritual outcomes engendered by CEs warrant the need to further study aspects of these results within the physical, behavioral, and social sciences. The difficulty for researchers in this arena, however, is that one can't control for when such transformational experiences specifically occur. This makes studying them directly nearly impossible. In spite of this, it is clear that such behaviorally transformative outcomes may result from either the reported CE by subjects in this study, a psychological aberration, or possibly something else which cannot be conceptualized at the present time. Consequently, the CE catalyst, which appears to alter aspects of consciousness and personal attitudes and viewpoints, is very difficult, if not impossible, to research (e.g., psychological and physiological) since the CE and associated effects spontaneously emerge in the CEr.

Based on the FREE study findings, future research in this arena should focus on experienced individuals (CErs) who report: 1) being "frequent interactors" (more than 10 CEs), 2) having conscious recall of their CE, and 3) having not reported a prior SMEE. This homogeneous population should be developed as part of a multidisciplinary study to address the following questions and methodological considerations:

1. Construct a reliable and valid psychological instrument to identify "true CErs" in order to assess the psychological outcomes of their CE. This instrument should be capable of measuring the extent and progression of an individual's CE, and distinguishing among different SMEEs (e.g., physical/sensory CE, non-physical/extrasensory CE, OBE, NDE, and DMT, etc.). The next step should be to assess via both quantitative and qualitative questionnaire measures, the features, attributes, and other dimensions of the CE that appear to influence or predict the extent of personal change that occurs in the CErs. For example, what role do such things as the content of communications with NHI beings, the modality of contact, and the reported sense of one's consciousness separating from the body, among other factors, play in eliciting changes in CEr attitudes, motivation, personality, and/or sense of well-being? Future studies should, therefore, begin to isolate the relative contribution of personal and situational variables, and related interactions, to observed changes in experiencers.

2. Future research should focus on frequent interactors whose responses may be more accurate and representative of characteristics associated with the CE. More specifically, how does a group of "frequent interactors" compare with the normal adult population and/or a control group on both standard psychological inventories, and on Positive Psychology measures? And how have the behavioral effects resulting from CE influenced their lives, social interactions, and family over time?

3. Collectively, the FREE study results, which suggest that the CE appears to be more a non-physical than physical type event, imply that future research may be more productive by incorporating both non-physical and physical CE populations to better understand the similarities of how each are described and experienced, and determining what factors may contribute to them in CErs.

It is critical to these research considerations that researchers cease studying the phenomenon as a separate science and to apply a multidisciplinary research-based approach. That is, to better understand the complex aspects of the apparent physical and non-physical characteristics of the CE and their associated impact on human behavior, research with CErs should be conducted using different approaches unique to several fields of study (psychology, physics, sociology, and biology, etc.). Consequently, a research plan supported by sufficient fiscal resources should contain appropriate goals as part of a protocol to help attract and assemble a multidisciplinary team of scientists to develop methodological approaches

to test agreed-upon hypotheses to study the phenomenon, and to publish their research in established refereed journals.

Discussion

Overview

While most UAP studies have focused on the psychological profile of the abductee/contactee, only a few studies with small sample sizes have examined the essence and impact of the CE on the individual's personal viewpoints and values, perceptions, and emotions. This is an important consideration for future research, especially since the FREE study indicates that approximately 70% (N = 3,256) of the study population claimed to have had very similar positive behavioral transformations as a direct outcome of their CE. In contrast, only 15–20% reported a "negative" impact resulting from their CE. In fact, the reported altered patterns of behavior and associated positive psycho-spiritual transformative outcomes in one or more forms of personal growth, attitudes, philosophical values, and an awareness and knowledge of other realities, represent the most significant outcomes of the FREE study. In addition, this study suggests that the CE with an NHI is largely non-physical and can occur via telepathy, during an OBE, being floated into a "matrix-like" reality, as well as through physical interaction on board a craft. Consequently, the non-physical ("contactee") CE, which appears to be distinctly different from the physical ("abduction") CE, suggests that they should be studied as separate but interrelated anomalous events.

Summary of Study Results

In summary, the study results incorporate a diverse and complex range of physical, psychological, perceptual, and paranormal activity that involve both perceived physical and non-physical type CEs, as follows: 1) The altered patterns of behavior, perceptions, and associated positive behavioral transformative outcomes were reported by approximately 70% of our study population (N = 3,256). In fact, 84% of a study sample of 1,919 subjects reported that they "did not want their CE to end." 2) The majority (71%, N = 455) of those who reported having had "conscious recall of being on board a UAP craft" claimed that their CE changed their life in a "positive way." In contrast, only 15–20% reported a "negative" impact from their CE; 3) The majority (71%, N = 433) of those who reported more frequent CEs (>10 times) were more likely to report that the CEs had a "positive impact" on "changing their life" (fewer than 25% reported a "negative impact"); 4) The majority of subjects (56%, N = 1,560) reported having been "contacted" in

a non-physical way and not physically "abducted"; 5) Approximately three-quarters of those who have had a CE consider themselves as "contactees" ("more egalitarian"—being treated as more of an "equal") and not "abductees" (physically taken and relocated on board a UAP craft); 6) A large percentage of the study sample (80.4% of $N = 1,381$) reported having had an OBE as part of the CE; 7) The majority of subjects (>65%, $N = 1,224$) did not report events and/or experiences typically associated with the traditionally held beliefs regarding the "alien-abduction" phenomenon. In fact, the UAP (physical craft) is only one characteristic of the CE which does not seem to be associated with most CEs; 8) The incidence of unusual experiences, such as reported observation of paranormal phenomena, NHI beings, and the positivity of the subjects' responses to these experiences, were remarkably consistent across countries and racial/ethnic groups with sufficient sample size to permit comparison. This argues against the notion that these experiences are simply an expression of cultural myths, archetypes, or memes; and 9) The reported positive behavioral outcomes facilitated by the CE manifest in one or more forms of personal growth, attitudes, spiritual and philosophical values. This is represented by their conviction of having become more open-minded with a more expanded worldview and understanding of themselves and what life is all about, and an awareness and knowledge of other realities.

Given this context, the overarching question remains as to whether or not the changes in one's insights and beliefs, as facilitated by their CE, actually represent a greater understanding and true perspective of one's self and life, or are instead induced in the CEr by some unexplained means. Collectively, the unique similarity of the physical and non-physical characteristics of the CE, and the associated behavioral outcomes reported by CErs, are certainly a matter of speculation.

Conclusion

In summary, the FREE study results raise considerably more questions than answers. One obvious question pertains to whether or not NHI beings are actually interacting with humans. Another concerns the nature of the specific characteristic(s) of the diverse range of both physical and non-physical aspects of the CE that may be responsible for facilitating the reported attitude changes reported by CErs. Within this context, it is worth noting the similarity of the physical and non-physical characteristics of the FREE study CE results with the general conclusions by noted researchers. Astrophysicist J. Allen Hynek (1978), for example, who acted as scientific advisor to UAP studies undertaken by the U.S. Air Force (Project Sign, Project Grudge, and Project Blue Book), concluded that:

> I hold it entirely possible that a technology exists which encompasses both the physical and the psychic, the material and the mental. . . . The UFO phenomenon is "so strange and foreign to our daily terrestrial mode of thought".

Similarly, computer scientist and astronomer Jacques Vallée (2003) stated:

> My personal contention is that the phenomenon is the result of an intelligence, that is technology directed by an intelligence, and that this intelligence is capable of manipulating space and time in ways that we don't understand. . . . The essential conclusion I'm tending to is that the origin of the phenomenon of the intelligence is not necessarily extraterrestrial. . . . I think we are dealing with something that is both technological and psychic, and seems to be able to manipulate other dimensions. This is neither wishful thinking nor personal speculation on my part. It's a conclusion that comes from interviewing critical witnesses, and then listening to what they have to say.

The similar conclusions by both Hynek (1978) and Vallee (2003), based upon decades of investigative research of UAP, are supported by the FREE study which indicates that an apparent intelligence or force of some type seems to take control of the individual and induces altered patterns of behavior, telepathic communication, and/or perceptions of space and time, among other complex symptoms during one's CE. In some cases, people also report receiving messages that contain personal counseling and guidance, religious–spiritual and scientific/technological information (Table 8). Such experiences may have contributed to the positive behavioral transformations reported by the majority of our study population.

While subject to interpretation and debate, CEr's dramatic change in personal and philosophical viewpoints (it is tempting to speculate) may support Vallee's hypothesis that the messages they report receiving, and their new transformative outlook on life, may contribute to what he called a "new cosmic behavior" or belief system facilitated by some form of intelligence to influence our society (i.e. altering old belief systems and enacting new ones). This concept, however, cannot be either firmly dismissed or supported since we have yet to determine the individual's own contribution to their overall experience of a unique constellation of physical and non-physical phenomena. Consequently, the only thing that can be said with certainty is that the reported atypical and extraordinary CEs, which represent a diverse range of psychological, physiological, and paranormal attributes, cannot be easily rationalized and scientifically validated but are perceived as "real" to those who experience them.

While it is premature to develop any firm conclusion from the FREE study, the results imply that the study population may actually characterize two or more types of CEs and associated phenomena. That is, a physical-based CE may be associated directly with the observation of a UAP and/or interaction with an NHI being on board a craft (e.g., approximately two-thirds (62–73% of $N = 2,430$) of the subjects reported seeing an "intelligently controlled craft" not "man-made," and slightly more than half (53–61%) observed an NHI being). More specifically, approximately one-fourth of the subjects who reported having had visual contact and communication with NHI beings, believe they have had physical experiences on board a physical craft. This included reported medical examinations and healings, and/or the implantation of a device, among other types of physical experiences with NHI mentioned previously. In contrast, a non-physical CE may be more symptomatic of a OBE-like state as described by Minero (2012) and Monroe (1977). This notion is based, in part, on the findings that: 1) the majority of subjects (56%, $N = 1,560$) reported having been "contacted" in a non-physical way (e.g., telepathic communication) and not physically "abducted"; and 2) the majority of subjects (53–62%, $N = 2,368$) reported "not" having conscious memories of being on board a UAP craft. These results are reinforced by the concomitent reports of experiencing telepathic communication with NHI beings; perceived change in time and space; a sense of "oneness" or "interconnectedness" with the universe, experiencing an "expanded consciousness," and the belief that their consciousness left their body during the CE, among other non-physical type CEs noted prior to the event.

Taken together, the results from the FREE study suggest that contact and interaction in the form of sensing, visualizing, and/or communicating with NHIs occurs frequently and only occasionally in connection with a UAP sighting. In fact, more than 75% of the CErs view themselves as "contactees" and not "abductees." It appears, therefore, that the CE associated with a UAP is not the predominant form of CE and that sighting a UAP is not necessarily associated with a CE. Consequently, it is not surprising that the traditional methodological approach of recording and investigating UAP sightings and traces has failed to advance our understanding of the essence/meaning of the phenomenon and the possible force which governs and regulates its behavior. This is an important consideration since the FREE study dispels the notion that contact with an NHI must entail either a physical abduction or a landed craft with beings exiting to interact with humans.

There is certainly no easy way to explain the results of the FREE study within a reductionistic standard model since current scientific principles are inconsistent with the diverse aspects of the reported CE. Consequently,

alternative theoretical perspectives and associated methodological approaches are needed to better understand unique experiences which incorporate feelings of altered perceptions, and of one's "consciousness separating from the body," often perceived as "very real" in nature by individuals who report a CE and OBE/NDE, among other SMEEs. Consequently, a new paradigm for viewing the role of consciousness, which appears to be an essential component of the CE, should attempt to determine if various SMEEs actually cause one to "see a different world," or instead, to "see the world differently" in a non-spatial/non-temporal context. It is also important for there to be independent replication of this study to help determine the validity of the reported results, which may serve as a foundation for others to build upon. At the very least, this study should serve to facilitate greater research interest on the part of psychologists and sociologists because of the CE's role and impact in the person's life, the association between the similarity among subjective reports and memory processes, and possible psycho-cultural influences. Thus, using a multidisciplinary approach that includes comprehensive psychological assessments, both the physical and non-physical characteristics of the CE must be analyzed quantitatively and qualitatively to note unique similarities/differences facilitated among different SMEEs, of which the CE with or without a UAP appears to be a part. This approach may help determine if a yet-to-be-defined aspect of consciousness serves as the unifying characteristic among different SMEEs.

The FREE study suggests that the CE can occur in a non-physical manner via telepathy, during an OBE, or being floated into a "Matrix-like" reality, as well as via physical interaction aboard a craft. But since we do not yet understand how to define an OBE or matrix-like realities reportedly acknowledged by a large percentage of our study population, it is likely that the survey respondents could not do so either, other than perhaps knowing that their state of consciousness was something different, yet "as real or normal as speaking with a family member." At this point, we can only measure distinctions to the level of precision described by the wording of the survey questions, and the meanings that "most people" would ascribe to concepts like OBE, Matrix-like reality, and conscious memory.

This study, which indicates that contact and interaction with an NHI happens very frequently via different altered states of consciousness (SMEEs), and only occasionally in connection with a UAP sighting, reinforces the notion that researching the physical characteristics of the UAP alone will likely not reveal the actual nature of what governs and regulates the CE and associated phenomena. In particular, research is needed to help refine the definition of such various altered states of consciousness to better determine

the causal forces (personal, environmental, and personal environmental interaction effects) that are influencing our subjects' reported experiences with NHI associated both with and without UAP. This objective should be facilitated using newly developed principles and associated methodologies, unique to the physical and social sciences, to test hypotheses on the role(s) that consciousness, and changes in CEr viewpoints and values, might play in explaining a poorly understood complex and elusive phenomenon.

Acknowledgments

The authors wish to acknowledge the contributions to humanity by the late Dr. Edgar Mitchell, one of FREE's co-founders. During his lunar trip in 1971 as an astronaut on Apollo 14, Edgar experienced a Samadhi awakening, "a sense of universal connectedness." This awakening began his journey to become one of the world's pioneers in the study of "consciousness"; the greatest mystery known to mankind. Edgar's vision resulted in establishing the world's leading research institute on consciousness, the Institute for Noetic Sciences. Growing up in Roswell, New Mexico, the site of the famed 1947 UAP crash, and having conversed with hundreds of military and government officials, Edgar became convinced that UAPs do in fact exist, and he began to publicly speak on this phenomenon. He eventually became the father of the modern UAP disclosure movement. This, in turn, led Edgar to converse with hundreds of individuals who informed him of their contact experiences with non-human intelligence. Edgar also became deeply involved in promoting the sustainability of Earth and feared that we are destroying our planet and humanity itself. Finally, Edgar's greatest accomplishment was in developing over the last 30 years of his life, with the assistance of a team of physicists, a model for exploring consciousness itself called the Quantum Hologram Theory of Consciousness.

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HISTORICAL PERSPECTIVE

Mediumistic Phenomena by Julian Ochorowicz Part II

Translated by Casimir Bernard and Zofia Weaver, edited by Zofia Weaver

Part I appeared in *JSE* 32:1, Spring 2018, and included the sections: Introduction, Excursion in Search of New Truths, A New Category of Phenomena.
Part II published here includes the sections: Warsaw Experiments with Eusapia Palladino, Official Sittings, and Conclusions Drawn from the Warsaw Experiments.

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Preface Summary—*Having returned from Rome a mediumist, Ochorowicz devoted all summer to studying the literature on mediumship and was amazed at how quickly it could be done—with a few significant works and hundreds of books of greater or lesser interest but no scientific value. That made him appreciate all the more the work of Crookes, Zollner, Du Prel, and Gibier. However, Crookes offers no theory and his observations stand alone as a register of facts that are hard to believe; this is a problem that can be rectified by reference to hypnotism, something achieved by Aksakov (who is a spiritist and accepts many sources which seem very dubious to Ochorowicz).*
P.S. The Preface, and the account of Warsaw Experiments with Eusapia Paladino which follows, were written in 1894, but the hostile attitude of the public in Poland to the question of mediumship meant that the report spent 19 years in Ochorowicz's desk. —Zofia Weaver

Warsaw Experiments with Eusapia Paladino (from 25 November 1893 to 15 January 1894)

She finally came. Cold, frightened, but when she was made welcome in my home she rallied somewhat. It was my knowledge of Italian that was the lifeline. Having realized that I can converse with her with ease, Eusapia regained her childish happy attitude and began discussions with my wife, who kept up her end by using French with Italian endings as well as gestures. A few days later they understood each other perfectly.

I was desperate to again test the reality of the phenomena, the absurdity of which from the scientific point of view was already beginning to win over the personal recollections in my mind.

Secondly, group sittings were supposed to start in a few days, which might test my reputation as an observer. Not surprising then that I awaited the first tests in Warsaw with some anxiety.

Among other things, I prepared for the experiments a number of tables made of white wood, larger and smaller, of different weight and shape. Expecting Eusapia to have some idea of what is suitable for experiments with her, I initially left it to her to choose the table, with the intention of trying out all the other ones later, to test the influence of weight and shape.

I learned later in Warsaw, and even more so on the island of Roubaud, that Eusapia knows very little about the conditions of experiments with her, that she only repeats what she has been told by others, and that one should not be put off by her reluctance to take part in seemingly impossible experiments, nor rely exclusively on her choices.

At this moment she only told me that the large table seemed too wide for her (causing her legs to be too distant from the table legs when she is sitting), but that the weight was not an obstacle. Finally she chose a medium-sized table which I used for the first time. It had quite a narrow top, but the legs were spread quite widely at the bottom and had flat square supports fixed to them. Even without these, it would have been almost impossible to move the table by simply pressing on the edge of the top, and the supports were designed to make it even more difficult in order to eliminate non-mediumistic unconscious muscle pressure.

The three of us sat at the table: Eusapia, my wife, and I, holding hands, not quite in the evening, with adequate light.

After only a couple of minutes, knocks could be heard within the table, supposedly coming from the spirit of "John." I easily checked that they were coming only from under Eusapia's hands, but at the same time I found that she did not cause them either by moving her fingers along the wood, or with a ring, or by friction of bones in her finger joints. Her hands were lightly touching the table and were quite motionless. However, every now and again you could observe in them a slight effort accompanying the knocks, a subject I will return to later. During these phenomena, and generally during sittings, her hands would stiffen, sometimes totally.

First of all I wanted to observe table levitation, as the phenomenon most accessible to investigation, leaving the others until later.

And a moment later, the table began to sway to the left and to the right, with the effort in her hands lying flat on the table visible but seemingly less than you would need to move the table. Suddenly it rose partially on the side of the medium and falling down hit the floor with such force that one of the supports broke and fell off—therefore in order to equalize the difficulty of swaying I removed the other supports as well.

It should be noted that the raising of the table on Eusapia's side could not have been caused by our hands, which were lying motionless on the top, not close to the edges. She had no hooks or threads that could have raised the table. The lifting could have been done mechanically only from below, either by the knees or feet of the medium, but the knees were visible and undoubtedly not involved in this movement. As for the feet, it is more difficult to explain. Eusapia's feet were on the feet of myself and my wife, and I did not think there had been any cheating. However, at that time neither I nor my wife had sufficient experience to rely on our subjective impressions.

On the other hand, I did observe the same fact that I noted at Siemiradzki's, which was originally observed by the Milan commission, the bulging of the dress. Eusapia's dress, usually on the left and always from the bottom, would approach the neighboring table leg and hide it to a greater or lesser extent. This bulging did not look like a foot or a rod moving toward the table leg, but more like a strong wind blowing and pushing it in that direction. Of course this had to be investigated thoroughly. At this point, however, I could only establish that this bulging could be obtained at will, on request, when Eusapia, holding my hand, moved it close to the edge of her dress. It would then approach slowly, as if being pulled and pushed, lightly touching my hand. I found that there was nothing electrical in that phenomenon.

Since the table responded with knocks to our questions, I asked what the purpose was of this bulging of the dress, was it to touch the table leg? No. John would not answer further questions, but demanded more darkness. He clearly did not like the supports, because he kept banging the table on the floor with great force until all of them were removed. Undoubtedly the main part in these blows was played by the mechanical force of Eusapia's hands, pressing from above. The only mysterious part was levitation, all the more so when soon after we achieved a number of full levitations, one of them very high. It also needs to be mentioned that if the table levitation had been produced by putting the foot under the table leg, the presence of the flat support would have made the task easier and John should not have been cross about it. On the other hand the removal of the supports revealed the sharp ends of the legs which would be very painful if one tried to levitate the table by using the foot underneath with the pressure of hands above. With a table of that shape one might conceivably lift it up for a moment, which would have been visible, but you could not achieve the kind of calm, level, correct levitation that was produced in Eusapia's presence.

However, I was suspicious of the following phenomenon: At the moment of high levitation the dress close to the left leg of the table lifted

a little with it, as if it had been glued, which would clearly indicate the presence of some mechanical support.

What was it? Not some special device, since my search did not reveal one. The leg? This natural supposition was made unlikely by the following circumstances.

1. Both my wife and I had the impression as if Eusapia's feet rested motionless on ours throughout, and pressing a little harder during levitation.

2. The knees were not raised at all, or at least not proportionately to the level which they (or one of them) would have to reach in mechanically producing the high levitation by means of the foot.

3. Levitation with the foot at that table, with the slanted legs, was impossible for me as well as for all the fit, agile people whom I asked to test it. Naturally, when building the tables before Eusapia's arrival, I tested their mechanical properties with great care and attention.

4. The dress clung to the table leg not from the bottom but higher up, as if a hand was holding the table leg and lifting it up.

The question thus remained unresolved at the moment, and all I could do was plan future experiments.

The Second Sitting

As I was planning the next experiments, my cousin S., an excellent hypnotic medium, came into the room. We added her to the circle. The light was still sufficient, because in spite of John's demands we did not draw the curtains. For this reason we as yet had not received any touches to our bodies. Levitations were repeated as before, one of them (in the dusk) so high that, while sitting, we had to stretch our hands high up in order to keep them on the tabletop.

Finally, to John's great satisfaction (he knocked with the leg three times, indicating "Yes! Yes! Yes!"), I drew the curtains. However, the darkness was not complete, because some light came in from the windows, but mainly also from the next room where the door did not reach the floor and a lamp was turned on. Against this streak of light behind Eusapia's back I could more or less observe her movements. She seemed to be in some peculiar state, but not full trance.

As soon as we sat down, the table (pushed by Eusapia's unconscious movements) made a friendly approach to my cousin and a moment later touchings began.

Since I warned my wife about the possibility of substitution of one hand for another, we made sure there was no doubt that we kept good hold, myself on the right hand, my wife on the left, well separated from each other and fully available to touch. At the same time we informed each other in Polish

about their positions. In spite of this, we were simultaneously touched by a hand on our knees, and then also simultaneously on our backs. The distance was somewhat greater than Eusapia's outstretched hands would have been if they had been free. Then, when I said that John should not tire out his medium, I was patted on the back to indicate "don't worry."

I would mention that I was sitting with my back to an enormous bookshelf, almost leaning on it, that we all undoubtedly did not break hand contact, and that after the first touches I was carefully watching in the streak of light the position of the medium. She was sitting motionless. If it had been her hand that patted my back I would undoubtedly have seen its shadow against the light.

This experiment seemed to me one of the better ones and gave me confidence that there would be no disaster later.

When we got up from the table and brought in the light, Eusapia carried out one more test with my cousin. She took my cousin's finger, held it motionless on the white tabletop, and then made a sign of an arc with it. That arc appeared on the table as a red smudge, as if drawn in blood, while my cousin at the same time felt a strong sting, pain and stiffening in her finger, which lasted a long time. The same experiment with my wife's finger (who is not sensitive to the hypnoscope) was unsuccessful. Eusapia waited a long time for the cold breeze in her fingers, tried to draw the sign, but nothing clear appeared on the wood. She also tried it unsuccessfully with me. I intended to analyze the sign produced with my cousin's finger to see if it really was blood, but the sign was not strong and faded completely.

Another interesting observation: Questions asked of John by my wife in Polish were answered by knocks from the table. I suspect that my cousin, who was surprised by the knocks, unconsciously contributed to this phenomenon. I also observed that while previously knocks came only from under Eusapia's fingers, once my cousin joined us (sitting at the other end of the table), the knocks moved toward her and seemed to come from the very center of the tabletop.

Another event worth mentioning: Eusapia went to town to buy herself some trifles. I gave her 3 roubles for that purpose, but shortly after she left she came back crying and saying she lost the money. She could not remember how and where, but she remembered that at one point she stopped in the entrance to a block and took a handkerchief out of her pocket.

Since I managed on a number of such occasions to get information by accessing unconscious memory, I sat down with Eusapia at my table, assuring her that John would tell us where the money fell out. However, my efforts were in vain, the table trembled under Eusapia's touch, got angry, hitting out at random, but told us nothing. The phenomena were

also delayed and were quite insignificant afterward, clearly affected by the negative mood of the medium. For this reason, fearful about the results of the next sitting, when she started searching again I surreptitiously put another 3 roubles under the dresser where she kept her things and persuaded her that she must have dropped the money while taking something out. This calmed her down and we could prepare for the larger sitting, to take place the next day.

26 November 1893

At about 20:00 hours, 8 persons sat down at a larger table, in the following order: Aleksander Głowacki [Prus],[1] my wife, H. Siemiradzki, I. Matuszewski, I. K. Potocki (editor of *Głos*), L. Herman, Dr. Rzeczniowski, J. A. Święcicki[2]. I stayed outside observing from a distance. Because of the presence of new persons, the phenomena took longer to appear, about 20 minutes. Five minutes after the first movements, there was a small levitation, a few inches, in full light; later, after the light was dimmed, a much higher levitation (some 20 inches off the ground).

Standing at the side, I carefully watched the left leg of the table, remembering from Rome that it can be the point of attachment of the mysterious force. However, I noticed nothing suspicious. The dress would approach the leg, would rise a little during levitation, but not so as to draw suspicion to the leg. Moreover, the controllers kept assuring me that Eusapia's two feet were in place. I should add that this was the table that on the first day seemed to Eusapia to be too wide for levitation. On the other hand, during another phenomenon I noticed something very suspicious.

The experiments were taking place not in my study as previously, but in the large drawing room, in the middle of the room, so I could observe them from all sides. Beyond the medium and somewhat to the left stood another table about half a cubit from the medium's chair. At that moment, this other table was pushed away and hit the floor with two legs a few times. Since this was behind the medium's back and nobody was sitting at that table, its movements caused amazement to those present; however, I had a better view of it and I was struck by the following:

At the moment when the table was pushed away, I saw clearly in the light of the candle standing on the floor nearby a movement under Eusapia's dress, such as if with a free (left) leg she simply kicked that table. The controllers when asked immediately answered that they were certain of having control of the medium's legs. Let us assume that they were wrong: At a stretch, it would be possible to push the table away with a movement of the leg; further, stretching the toes, one might even pull it back, but it would have been impossible to lift the table and bang it on the floor for a foot in a

bootee, since the table legs were totally smooth providing no support for the leg. Such movements could only be produced by a *hand* or a similar device.

There certainly was no device, and the hand could not have been her hand. However, this little detail made me very alert.

At the moment when we have had enough of table movements, and knowing that music helps with the phenomena, I sat down at the piano at the end of the drawing room and began to play, first a Chopin prelude, and then a polka. Immediately the table with all those present, who were forced to get up from their chairs, threw itself toward the piano (clearly pushed by the unconscious movements of those present and Eusapia) and began to jump up and down indicating its pleasure, in time to the music.

Something very puzzling happened when I got up from the piano. The table was then a few steps away from the piano but in spite of this one could hear the keys being hit by the fingers of some invisible hand, while another invisible hand was banging with its fist on the table, in time with the keys. (Eusapia cannot play and there is never any proper piano playing with her, just more or less melodious drumming).

The blows on the keys were quite weak, while those on the table (closer to the medium) were very strong. Needless to say, her hands were being well held all the time.

When the lights were turned off, touches began very quickly, and I made the following observations:

1. Only persons sitting close to the medium were being touched, on her right Prus, on her left Święcicki—they had a few, or even more than a dozen touches, six of them clearly with a hand.

2. Among those sitting farther away, only my wife was touched, who had participated before. Newcomer Dr. R. was not touched although he sat quite close.

3. Among those sitting still farther away, nobody was touched, even Siemiradzki, whom John usually favors.

4. I, being outside the circle, was touched twice, but only when I was close to the medium. Once (for control) I put both my hands on her shoulders in order to feel them move and then a hand, undoubtedly not hers, pushed my hand away from her left shoulder. The same happened when I placed my hands, standing behind her, on her hips. Again my left hand was moved away with the fingers of an invisible hand.

5. The touches began from the medium's left side, but then took place both on the left and the right.

Other phenomena included a few lights, like glow-worms, in total darkness, only close to the medium, and the puzzling phenomenon of writing between two slates tied together.

I bought them for the experiments, one was smooth and the other one had a red grid on it. Before the sitting I examined them closely, tied them with string and sealed the corners. When the experiments were finished and we turned on the light, I looked at the seals and knots, which were untouched, but in spite of this on the inner side of one of the slates we found a zig-zag in the shape of an enormous P, drawn undoubtedly in the same red paint that was used to form the grid. It looked as if someone had taken part of the atoms from the paint on the grid and drawn the sign. It was as clear as the grid and, like the grid, could not be rubbed off. The form of the sign resembled one of the squiggles I had already got in Rome. I have no doubt that the slates had not been opened and the sign was created in some unexplained manner. After this sitting Eusapia was not at all tired, she came to herself quickly and we had supper.

I intended to end the evening there, but Mr. Herman (the only spiritist among us) insisted on having another experiment to confirm the participation of independent spirits in the sitting. It turned out that a "spirit" which communicated in another circle, totally unknown to any of us, announced that it would come to the sitting with Eusapia at my house. It was to announce its presence in two ways, by:

1. knocking a particular number
2. bringing a flower for Eusapia.

Only one participant knew about this.

The number was knocked, but not sufficiently clearly, and unless I am mistaken the questioner simply influenced by his intonation the fact that after 19 knocks the table stopped. I had the impression that if someone else had been asking, who did not know the required number, the table would continue to knock chaotically as it had been doing previously.

The promised flower did not appear at the second sitting either.

The other phenomena included only a few stronger levitations of the smaller table, in reasonable conditions, and one nearly certainly without any hands touching the table. Once, when the table rose, sitting outside the circle I was holding Eusapia's two knees with one hand and I am certain that there was no suspicious movement.

John would not demonstrate the bulging of the dress. However, he tried to lift the medium herself, standing in the middle of the room. These were efforts to raise herself on her toes, as if someone were supporting her under the arms, but she did not leave the ground.

Even though the results of this additional sitting were mainly negative, it tired Eusapia both because it was the second one, and because it took place after supper, which always had a negative effect; she was still feeling confused and tired half an hour later.

As I said, Eusapia arrived with a cold. The sudden change of climate (she arrived directly from Naples in Warsaw in mid-winter) made it worse. She complained about the air pinching her cheeks and being breathless. It turned out that both her bronchia were infected, she had pains in her back and a bad cough. I was worried about her health and about the success of the first "official" sitting to take place in a few days. The easiest thing would be to hypnotize her and put her to sleep for a longer time, thus relieving the pain and the cough and giving her time to recover. However, without knowing how hypnosis would affect the phenomena, I did not do this, and relied only on hand passes and metallotherapy. As it turned out later, my fears were groundless, since hypnosis always had excellent influence on the phenomena. [*Descriptions of various treatments.*]

She could not sleep, because she kept thinking about the success of the experiments and how to convince everyone, which she wanted very much.

"I had an idea in the night."

"What idea?"

"The way to stop people suspecting me. Tie the hands of all those present, mine as well, with one rope."

She was very pleased with this idea. Of course I promised that I would do as she wished.

Before the day of the official sitting, I wanted to conduct another experiment: to put a number of mediums together. I knew that once the official sittings started I would have to ration her powers and refrain from my personal experiments, and I also expected that everyone would want something different.

The news of Eusapia's arrival spread like wildfire. My letters from Rome, published in *Kurier Warszawsk*i and "Remarks" which had been appearing in *Tygodnik* for a long period, as well as news from abroad about the earlier experiments in Milan, created such interest in Warsaw that the discussions and controversies were endless. [. . .]

Abroad the news of Eusapia's unexpected arrival in Warsaw (she did not want to go outside Italy before) also caused great excitement. Chiaia from Naples, Prof. Faihofer from Venice, Prof. Richet from Paris, Dr. Schrenck-Notzing from Munich, the SPR from London, Aksakoff from St. Petersburg, and many others wrote to me asking to be informed about the results of the experiments. If she had wanted, Eusapia could have chosen excellent offers and acquired significant sums of money. Among others, Lord Carnarvon from London was prepared to offer virtually anything if she agreed to come to London. In Warsaw itself she was being offered 500 roubles for an evening. If she had wanted to go to Petersburg and Moscow she could have earned more than a 1,000 roubles, sitting in spiritist circles

with almost no controls. She firmly rejected all these offers, saying she only came for my experiments at Siemiradzki's request, and she would not take any money apart from the agreed compensation for the loss of profits from her little shop in Naples. And in fact, when I wanted to add an appropriate sum to the agreed 1,000 lira (about 450 roubles) because her stay in Warsaw was prolonged, she would not take it and I had to send it on to her by transfer to Rome.

I add these details to ask all those who write the calumnies about her in the Warsaw press whether they would be equally disinterested in her place? I doubt it. I have heard that, if they are publishers they pay 2.5 copecks per line for scientific texts, but I never heard about any of them giving up their time, their health, and easy and plentiful money for the sake of science. Not surprisingly, in this respect I value the simple seamstress from Naples immeasurably higher than I do them.

[*Ochorowicz continues in the same vein about the local claimants as well as genuine local mediums being put off research by the media hostility. He then goes on to report his experiments with Mrs. K., who used to make tables and chairs move toward her as she walked past, with her dress bulging at the same time. Ochorowicz received a letter reporting these events from her husband, and decided to see if this phenomenon would repeat itself.*]

With this in mind, I sat alone with Mrs. K. at a small table, having first checked her with the hypnoscope to make sure she was sensitive to it.

I purposely used a very small, light table on 3 legs to facilitate the initial phenomena. Even so, we had to wait a good half hour, after which time the table began to sway under the influence of unconscious spasms of tired muscles, becoming gradually more lively, and finally it seemed to be pulling us with it toward the door to the drawing room, where the light was not so strong. Then, on request, the table rose in the air a few times, and on each occasion Mrs. K.'s dress, bulging, moved closer to the table as if assisting the levitation.

Since no other phenomena were forthcoming, I called in Eusapia and, returning to the study, we sat down as before, the two of us in the light of the lamp, with Eusapia touching our hands lightly from above. With each touch the movements became stronger and moved toward the medium. I then sat down alone with Eusapia. Eusapia was sitting sideways on the chair, having stretched her legs in front, with only her left hand on the table. I put my right hand on the other side and bending and looking under the table I could observe clearly both the position of Eusapia's legs and the movements of the table. After a pause of a few minutes the table began to sway to right and left, and during these movements one table leg came down on the edge of Eusapia's dress. It stood motionless like that for a moment, and then the

dress began to withdraw, pulling the table behind it. Both Eusapia's feet could be seen clearly. It looked as if someone's hand under Eusapia's chair was pulling the dress, and the table with it.

I then moved the table out of the way and investigated the movements of the dress. There was nothing there, but when I held my hand a few inches from its surface, it would approach my hand and then withdraw; if I tried to grasp it, there was nothing there.

At that point we were joined by my cousin, Miss S., and my wife.

Mrs. K., interested, wanted to experience the phenomenon personally; she put her hand close to Eusapia's dress, and the dress moved forward, while Mrs. K. drew back screaming.

"A hand touched me through the dress!" she cried.

My cousin behaved in the same way, claiming that some human hand encircled and hugged her. As I mentioned, both were sensitive to the hypnoscope.

My wife and I, in spite of waiting, did not experience anything of the kind. The dress moved, but we did not feel any hand.

Having no success with further trials, I returned to the table and having waited a while I achieved a number of levitations, i.e. the table rising fully from the ground while Eusapia's legs were visible and only one of her hands (left) rested on the table. On each occasion the dress would approach and touch the leg of the table; during one full levitation Eusapia was touching the table only lightly by touching the top of my hand resting on the tabletop.

We then moved to the drawing room, where it was quite dark, and all stood around the table, myself and the three mediums. The table began bouncing immediately. Levitations followed each other and were so high that we had to hold our hands stretched above our heads. In this position, i.e. suspended in the air, the table traveled across more than half the drawing room.

When my wife sat down at the piano, the table violently moved in that direction and started jumping in time to music.

After a moment came the touches. All four of us were touched countless times, but Mrs. K. and my cousin were so frightened by this that they did not want to carry on with the experiments. I therefore stopped the sitting.

To my great regret, I never experimented with Mrs. K. again, but my cousin took part in later experiments. [. . .]

"Official" Sittings

29 November 1893

This was the first official sitting, the participants all being skeptical and a random collection resulting from the fact that they were the first to register.

Eusapia was frightened; while she was always willing to be tested by friendly and familiar persons, she would suffer and suffer doubly among strangers, particularly those who mocked her or were disingenuous, and the phenomena would be weaker as well.

[*General comments on attitudes to mediums*.]

Before the sitting I tested the electrical resistance of her body. The galvanometer, after applying the hand to the electrodes (wide, copper ones) showed a deviation of 63°; immediately after the sitting it was 25°; half an hour later, 30°. Changes in the pulse were very minor.

At first there were 9 participants, with Marian Gawalewicz[3] sitting outside the circle, next to the medium, holding her knees. Everyone's hands, including Eusapia's, were tightly tied together with a long string, leaving only limited freedom of movement. Also, Eusapia's right hand and leg were controlled by a lawyer, St. Leszczyński, and the left by Dr. Jan Wróblewski.

In order to facilitate the phenomena in the new circle, I included two participants who had already taken part in the trial sitting. Even so, the beginning was hard. It was 20 minutes, with Eusapia hot, before the first movements of the table began (the larger one, weighing 25 lbs). This was a few days after the full moon, on a cloudy and windy day with rain and snow. The phenomena were generally weaker, only levitations more numerous in the light than at the test sitting.

There were few touches. [. . .] In this respect, the following should be noted:

1. Of those sitting closest to the medium, only one neighbor on the left was touched (Dr. W.) The neighbor on the right (lawyer L., insensitive to the hypnoscope) was not touched at all.
2. Farther away, slightly more sensitive lawyer A. Kraushar was touched once, the others not at all.

The rope tying everyone together was later removed, but the phenomena did not intensify, although the sitting lasted until one o'clock in the morning.

30 November 1893

Eusapia was quite ill in the morning, having slept badly (at that time I was not yet hypnotizing her), complained of aching bones, and she did not eat until noon. She began to cheer up by lunchtime, in the company of friends and well-disposed new guests. Three people came to dinner that day, Siemiradzki, Prus, and Święcicki, all of whom Eusapia liked very much. She was telling us about her reception in the home of Minister Crispi, and altogether was much better.

After dinner I wanted to show my guest Miss S.'s ability to read without using her eyes [*description of successful experiment follows*].

Eusapia, always willing to experiment in a small circle, agreed to a short session and we moved to the drawing room. Miss S. sat down next to Eusapia. However, as soon as movements started, John demanded the alphabet and knocked:

"Wake up Miss S., do not mix two states."

On turning on the light I discovered that Miss S. had really fallen asleep. I took her next door, woke her up thoroughly, and then made her sit not next to Eusapia but at the other end of the table, as told to us by John (i.e. Eusapia in trance) in order to bring on the phenomena.

After changing the seating arrangement the knocks which until then came from under Eusapia's hand moved to the middle of the table. On that table I put a second, smaller round table and next to it Crookes's delicate device called radiometer, wanting to learn whether mediumistic lights or some other force would move its mill, suspended in a vacuum.

The round table meanwhile began to jump and rise above the table, and at times we could hear strong blows on its top. In spite of these jumps the radiometer next to it was not disturbed, but all those present advised me to take it off before it got damaged. I picked it up and carefully put it down in the corner next to the piano. It was undamaged, but after the sitting we found it lying broken on the ground. Nobody heard it happen, but when I later questioned, separately, Eusapia in a trance and Miss S. in a magnetic sleep, both said that it caught on Miss S's dress when they were changing places at the beginning of the sitting. Awake they were not aware of this. [*Other experiments with Miss S. confirm this ability to recall events not remembered when conscious.*]

This sitting was one of the best. Apart from the movements of the little table on top of the big one, which nobody was touching, there were numerous and widespread touches, two successful levitations of the medium together with the chair onto the table, we saw the shadow of a hand touching the medium's double, and finally movements of furniture at a distance. As to the touches, they reached much farther than usual. All those present except Prus were touched, but I had a clear handclasp while sitting at the same distance, under the following circumstances:

Miss S. who, at John's request, was sitting at the end of the table, entered a trance state for the first time. [*Remarks on it being different from the hypnotic state in greater body stiffening and greater independence of mind.*] Because of not being conscious she kept slipping off the chair, and so I sat next to her and held her shoulders with my right hand, and held her left hand with my left; her right hand was held by the neighbor on the right. Suddenly, above the shoulder of my cousin an invisible hand clasped mine, some 2 meters away from Eusapia—but I cannot say whether this may have been the mediumship of Miss S.

Siemiradzki and my wife saw a shadow of the touching hand, even though they were absolutely assured of holding Eusapia's hands.

After a moment Eusapia's chair was pulled from under her and placed on the table. She then started swaying and had to be held up. I therefore took the chair off the table and tried to put it under her, but before I could do so it moved back onto the table.

A little while after that Eusapia, still held by the hands, rose in the air and was seated on the chair standing on the table.

We helped her slide down and sit down, but a moment later she was again lifted in the air together with the chair, which hit the table with such force that the tabletop broke in half.

In the semi-darkness we all saw her sitting and seeming to sway; she then got up and leaning on us came off the table, silently walking around outside our chain to reach her place. But we were amazed to see immediately after what seemed like a shadow of a second Eusapia also slide down and travel the same route but inside the chain, to the same place where it seemed to join the medium's body and become one. Prus exclaimed that he saw her pass twice, and so did I. [. . .]

We turned on the light and sat down to rest (Eusapia was still unconscious), when the furniture around us started to do the strangest things.

The settee on which Eusapia sat with two other persons violently moved away from the wall. A table with photographs on it began to wander around the room, and the heavy desk under the window a few steps away from the medium began to move here and there.

My drawing room has three windows; the first had no light coming in at all, the second only had the curtain drawn across it, the third was open to the light. The light from the garden came in gradually weaker, from the third window to the first.

The levitation of the table started when we were standing by the dark window; the table rose above our heads and moved toward the second window. At that window the force weakened and it lowered itself but still hung in the air; by the third window it fell onto its two front legs and moved along the floor only partially suspended.

1 December 1893

After this sitting Eusapia did not feel tired. In the night her period started; at first it did not affect the phenomena but by the evening it was clear that she was tiring more quickly and that the phenomena were delayed. Also, the right side of her body became stronger and the phenomena appeared almost exclusively on that side. [*Ochorowicz did not know this and invited T.*

Dunin, a doctor, to observe the phenomena with Eusapia in a small circle.]

First I showed him the levitation of the small round table, with Siemiradzki and myself each holding one hand on it, with our legs out of the way, giving Dr. D. a full view of the movements in the light of the lamp.

The presence of a new critic, and her current physical state, badly affected Eusapia, but a levitation did take place. Dr. D. smiled, nodded, and kept silent. We moved to the large table which after a long wait (25 minutes) finally moved and also rose completely in the air. There were also touches, not numerous and only on the right side—not expecting this I sat the doctor on the left which was usually better for observation.

Dr. D. demanded that John pull out of his hand a copper plate which he held tight, but John refused, promising to do it on another occasion. He also promised (via Eusapia—entranced) to turn on the electric lamp. There were also numerous movements of small objects from one table to another, but I did not make a note of these. Eusapia was clearly exhausted, the doctor was in a hurry, and so we stopped the sitting, but the next day I had a letter from him requesting to participate in the collective experiments.

2 December 1893

[*Ochorowicz spent the day preparing various devices to measure the distance from the medium at which mechanical phenomena could take place, and the range of the force. One of these devices was a bell hung from a rod held motionless by supports, and able to move only to left and right (where the medium could place her hands), the whole standing on a large table which would not vibrate. Eusapia came back from the theatre in a good mood and after 20 minutes made the bell ring a number of times.*]

3 December 1893

[*Eusapia's period ended, and this was to be the day of the second collective sitting, with another circle, since there were so many wanting to participate. This time there were ten participants, including myself, Matuszewski, who was to make notes, and J. Szadkowski (lawyer) who was to take photographs. There were five doctors (Watraszewski, Higier, Harusewicz, Rzeczniowski, and Dunin—who was as usual late and in a bad mood).*]

This was a bad day for Eusapia. She went to church in the morning and then for a walk. Having forgotten the card with the address, she could not ask the way home and she kept wandering about, taking trams from one end of town to the other, until she happened to find the way home. Exhausted, hungry, and tearful after four hours of wandering, after being fed she went to bed and fell fast asleep. She was still asleep when the sitting

was supposed to start at 20:00, everybody came but by 21:00 she was still fast asleep and finally had to be woken up.]

She came down sleepy and exhausted, and it took three hours for the better phenomena to appear, while the first movements of the table did not begin until after an hour. I have to admit that the participants were very patient.

We wanted to investigate the knocks, which were normally produced around Eusapia on request. You would knock on the table three times and you could hear similar three knocks in the wood; you could alter the rhythm and the force used and produce an exact echo a few seconds later. This mediumistic echolalia was not limited to knocks; rubbing with your hand, scratching with a nail, softly drumming with the fingers, or hitting the table with a fist would produce a mysterious repetition. Eusapia would very often not even touch the table, only hold her hand above it and would ask the observer to put his hand on the table to feel that something was hitting the wood.

But unfortunately this time there was nothing. There were a few, barely discernible knocks. There were a few lights, but so weak and under such conditions that not everyone saw them, giving rise to arguments and hypotheses of hallucinations.

The touches were also weak and few. [. . .] A better phenomenon was the pulling from a distance of another table, on wheels, behind Eusapia's back under conditions where she was held from behind and would not have been able to reach it.

Dr. D. left without signing the report, followed by a few others. But with their departure, and the arrival of Siemiradzki and Prus, Eusapia livened up and the phenomena improved. We first had the movements of the bell, witnessed by Prus, Matuszewski, Szadkowski, B. Reichman,[4] and Dr. Karusewicz—and then Eusapia set in motion a miniature table with four legs, two inches high, which would rise and turn over under the influence of her hands at a distance. Dr. Higier noted that every time he was close to the table nothing would happen, and as soon as he moved away the bell and the table would move easily. He was all the more puzzled because he was not hostile.

In any case nobody was complaining then, even Mr. B. Reichman. People applauded or nodded, some left convinced, but the majority, particularly those who left early, had a very skeptical attitude. I should add that before the sitting Eusapia was thoroughly searched and undressed in the presence of one of the doctors.

4 December 1893

I let Eusapia rest, and I hypnotized Mme. M. who had been present during the experiments in my home circle, in order to find out her impressions.

"Remember everything you noticed during the sitting with Eusapia and tell me what it was, whose power and what power it was, whose hands touched you, was it a hoax?"

"She pulls something to herself from outside, so that the room becomes stuffy."

"What does she pull?"

"I don't know what to call it."

"And whose hands did the touching?

"I felt her hands, the same up to the elbow."

"So she did the touching?"

"No, but they were the same—different, but from her."

"So what was the difference between those hands and hers?"

"I felt that I could not hold them like real ones, although they were also small, warm, rough, and the fingers made the same kind of movements."

"What kind of movements?"

"Her kind—delicate, fragmented, light."

"And was the arm the same as usual above the hand?"

"I cannot say for certain, because I only felt it through my back, but it was all delicate."

"And did this arm have a sleeve?"

"If it did, the fabric was very thin."

"So, what was your impression as to where the hands came from?"

"From her, the same."

"Exactly the same?"

"Not exactly, because under their skin things did not move as they do in her."

"What did not move?"

"I don't know, but when I touched her when awake, there was something moving under her skin, all the time, back and forth, something mobile under the skin . . . but the hands that touched did not have that . . . And also they were soft and as if not complete."

"But perhaps it only seemed like that to you, perhaps she did the touching?"

"She could not have done, because it was above my head." (Mme. M. is very tall and Eusapia very short, and the experiments took place when they were standing, with Mme. M. holding Eusapia's right hand.)

5 December 1893

The third collective sitting (of the second circle), joined by Dr. Heryng, was better than the previous one. I used the table with the slanted legs and put it on the carpet. This meant that the sliding and moving to right and left, which made observation difficult, was not possible and we had frequent levitations. Eusapia was in a good mood and raising the table came to her easily. Sometimes she would lift her hands off altogether and hitting the table with one hand and ordering it to rise would produce the effect. However, in spite of the leg shape and the carpet, I found it difficult to work out how the force that lifted the table attached itself to it. It seemed clear to me that it was mainly the left leg, and that the point of attachment was quite low, as if a strong hand was holding the table leg a little above the floor. The dress would always arrange itself there into a kind of tent, undoubtedly to create darkness, and when I tried to light it on purpose, the table would always turn itself as if to increase the darkness during levitation. [. . .]

We took four photographs of table levitations, but they don't look sufficiently convincing, since none of them shows the left leg in full.

I also repeated here one very good experiment from Milan with some modifications. The idea was to use the dynamometer to show the change in the weight of the table under the influence of Eusapia's hands. To this purpose, the table was suspended on a rope from the ceiling with two legs in the air and two on the floor, with a spring scale and a hook. Initial weight was 6.5 lb. When Eusapia put her hands under the table (in only this way could she lift it), it went down and weighed more than double, 14 lb. [. . .] When she put her hands above the table and tried to bring the weight down, it eventually went down to zero. [. . .] During all these tests the dress on the left side kept billowing, in spite of being held, and kept approaching the left leg of the table. When I experimented later by myself I did not try to stop the dress from approaching the table; on the contrary, I held it close to it, having first tied Eusapia's legs. I do not understand why some doctors kept trying to obtain the phenomenon while destroying the necessary conditions by pushing the dress away all the time. [. . .] For me, there has been no real change in the weight; the table was simply being pulled or supported by a hand, but the hand was not the material collection of cells, it was a dynamic model of the hand, usually inseparable from the physical one. [. . .]

At the table sitting afterward the touches were quite frequent and spread farther.

We wanted an imprint of John's hand on a paper with soot on it, but John demanded more darkness, and that was impossible. There were also powerful sound phenomena, knocks and blows of a fist on the table, and in the air were heard clapping and snapping of fingers above the head of

the medium. The evening culminated in the medium being put on the table together with her chair. What seemed to happen was:

1. Eusapia got onto the table first.

2. The chair followed, and then it fell off, it seems because the hand chain was broken [*followed by general confusion*].

There were also a few lights that seemed to come from the middle of the table.

After the sitting Eusapia was very poorly, but recovered quite quickly. [. . .]

6 December 1893

Day of rest, Eusapia visited the Music Society with my cousin. [*Discussion of Eusapia's pains.*]

7 December 1893

[*More about Eusapia's condition, and the influence of hypnotizing her to sleep. In the evening they took her to the circus, but she took it all too literally, being frightened by the acrobatics and indignant on behalf of the clowns.*]

After the visit to the circus we sat down to supper, but the table, large and massive, immediately started to move and knock, even when Eusapia got up and moved away from it.

In the night (Eusapia slept in the drawing room, next to our bedroom), there were the sounds of the bell hanging from the ceiling (intended for experiments), and knocks inside the wall. [. . .]

At 11 a.m. Eusapia was still fast asleep. We came in, hearing knocking; she woke up when we entered, but the knocks continued inside the settee, and in the chair standing nearby. All these knockings took place on the darker side, not on the side near the window. Soon it all died down.

8 December 1893

A very good sitting requested by a high-ranking person (Maria Andreyevna Hurko, wife of the Governor-General of Warsaw. The sitting took place at the Censorship Committee, in the apartment of its chair, Mr. Jankulio). Details have to be omitted, but the table, constructed specifically for the purpose, with legs so thick that you could not get your hand around them and weighing about 40 pounds, rose twice but it demanded a great effort from Eusapia, who asked to have it changed. There was also a strong blow by an invisible hand on the table; the bell would not ring, but it did sway and vibrate.

9 December 1893

[*After the sitting Eusapia was very tired, so Ochorowicz induced sleep again; her condition is then described in detail, as well as her comments when interviewed about it under hypnosis.*]

10 December 1893

[*Continuation of treatment of Eusapia's poor health, including a warm bath, recommended by herself under hypnosis. Also a description of a plot by a number of men of science who wanted to unmask Eusapia and discredit Ochorowicz by presenting an ultimatum as to the conditions of the sittings; if he agreed the controls would ensure failure, if he objected they would publicize his refusal. Having discovered the plot, Ochorowicz pre-empted their demands by putting forward his proposals: to have Eusapia searched by two doctors and change into different clothing before the sitting; to have all the experiments take place in the light; the controllers to be selected by the doctors themselves; after the initial sitting Ochorowicz would no longer be in charge of the later ones, and the participants would decide on the later experiments.*]

All the furniture was removed from the room, apart from that necessary for the experiments. The part of the room next to the window (second floor) was divided from the rest by a curtain with a slit in the middle nailed to the walls. Behind the curtain was a small table, on it a bell, and next to it a chair with slates tied together. While two doctors supervised the changing of Eusapia's clothing, others searched the room. When they finished, Eusapia came in with the two searchers, and sat down on a wicker chair before the curtain, in the middle and with her back to it. The controllers were Dr. Heryng on the left and Dr. Watraszewski on the right, holding her hands and with their feet controlling her legs. Her hands were also tied to theirs with an elastic rubberband. Before her stood a smaller but heavy table, and the other participants sat around it, forming a chain with the controllers.

I held myself at a distance, checking on the light from a lamp, a little dimmed at the other end of the room directly opposite Eusapia.

Phenomena started quickly, first movements of the table sideways and upward, then a levitation long enough to look under the table to make sure there were no supports there. Pleased with this beginning, Eusapia started to enter trance state, ordered the table to rise and in fact the table rose a number of times without being touched by anyone. There could be no involvement of hands (except for an invisible one lifting it from underneath). [. . .] After a moment the curtain began to move, as if blown by the wind, and something moved the large bell behind it without making it ring. The nail holding the

edge of the curtain was pulled out of the wall, the curtain opened and Dr. Heryng saw the slates on the table rise and fall a number of times without anyone touching them.

Although Dr. Heryng, who was convinced by the phenomena that evening, later changed his mind, he did include this detail as "inexplicable" in his report.

Hands started to touch Eusapia's neighbors from behind the curtain. Both controllers were touched numerous times.

This evening made an impression; the opposition became divided. One of the leaders of the plot, a doctor, after the sitting kissed Eusapia's hand and apologized for being suspicious of her. It confused her, since she had not been told about the plot being prepared. [*Ochorowicz then suggests that the next sitting should take place in Dr. Heryng's apartment, with details being discussed*].

Eusapia was in such a good mood that she carried on after the sitters left, and with just the family present (who did not take part in the official sittings) stood between two tables and, leaning with her hands, made both of them rise and bounce against the floor, and there were knocks as well.

Since John King was in a good mood and responded to questions, I asked Eusapia to try direct writing. First I gave the pencil to my cousin to see if she could produce that phenomenon. The pencil had an eraser at one end, and the idea was that writing should be produced with the eraser being held against the paper. When my cousin held the pencil, the eraser simply moved along the paper, but when Eusapia put her hand on my cousin's hand, this produced signs clearly made with the pencil. This stopped when she moved her hand away, and started again when she brought it back, but the writing came out as meaningless squiggles. The same experiment also worked with my wife, producing something like a straight line ending with what looked like an M. This encouraged me to try it myself. I held the pencil with the eraser on the paper, Eusapia put her hand on mine, in the light of the lamp standing next to us. She asked, "Can you feel a cold breeze in your fingers?"

"No, or at least only something very unclear."

"But I do feel it." And, having said so, she moved her hand as if pulling the pencil end to the eraser end, and then again placed her hand on mine.

"Write now."

Black signs did in fact appear under the eraser—and they became fainter when she moved her hand away, disappearing altogether when the hand was far enough away. The pencil would not write by itself, without being held. [. . .]

She had a quiet night.

11 December 1893

Eusapia was well, and so a small home circle could be arranged without tiring her. Miss S. entered a trance state and helped the phenomena. [. . .] Those worth mentioning included:

1. A bowl of clay was prepared for the first time. It stood on another table nearby and weighed together with the clay about 20 pounds. Behind the curtain was another little table; we sat as at the previous sitting, with Miss S. opposite Eusapia at the other end of the table. [. . .] There were no table movements and levitations as usual, but I felt in the dark something moving above me brushing my head: that was the bowl of clay being moved to the main table from the one on the side. I am certain I was holding Eusapia's left hand while Siemiradzki held her other hand, but even if the other hand had been free she could not have lifted the bowl and carried it across.

After the bowl, I again felt some movement above my head. I felt with my hand and found that the table that had stood behind me was now on the main table above the bowl. After the third rustle, the third little table from behind the curtain was above that second table. We turned on the light and checked. Eusapia undoubtedly sat in her place throughout these proceedings.

2. Touches, stroking, patting, etc., were numerous. They reached all the persons on the right, who all had participated previously, and on the left stopped with me, because beyond me was Miss S., who was participating in a sitting for the first time.

There were also strong blows on the table and drawings on our cuffs with a pencil of unknown origin.

3. A great number of little lights, single ones, making arcs in the air and disappearing. Once they formed into two groups of five that came closer and then would move away. They gave me the impression of being two hands, the finger ends of which had phosphorescent little lights [like the odic lights of de Rochas]. I think these lights are just flames coming out of the dynamic hands of the medium. One of these hands took Prus's glasses off his nose and gave them to my wife, but by then it was not luminous. It seems that the lights are the equivalent of mechanical work, so that only one or the other phenomena can appear but not both together. In the same way, when sound phenomena are present, the luminous and mechanical phenomena disappear.

4. At this sitting for the first time we obtained voices, only two. Both seemed to come from above the middle of the table, one was hoarse and incomprehensible, the other said clearly in Polish "głos" [voice]. That was at the moment when Miss S. was falling into trance and her body was

stiffening. Shortly after we heard the second voice, Miss S. came out of trance but still seemed confused. Through Eusapia, John advised putting Miss S. to sleep for three quarters of an hour, which I did, and she woke up cheerful and not tired.

5. Against the window we saw shadows of hands and as if the figure of a person moving, but it did not last long enough for me to describe it any further.

6. We found a print of a finger in the clay.

7. On the slates we found something resembling writing, but no clear signs.

12 December 1893

[. . .] [*JO sits Eusapia at a little table and learns through knocks that the first voice came from Eusapia and the second from Miss S., and then takes advice on how to treat her condition—cough and depression. He also suggests to Eusapia that the sitting to be held the next day must be successful.*]

13 December 1893

Before I begin a description of the session that took place at Dr. Heryng's home, the session that was the culminating point of the official sittings, I must briefly describe the basic conditions for this kind of meeting, in order that the reader should understand the course of events that ensued.

Experience teaches us that whatever the process of creating higher-level mediumistic phenomena, success depends upon certain conditions, non-adherence to which will most certainly have a paralyzing effect. I presented these to the participants at the first meeting. Some listened, but in the facial expressions of the majority, doctors in particular, I read only derisive contempt: 'Carry on! It's all magic and mysticism . . .'

Events that followed shortly, after I declined to direct the sessions, showed the wisdom of listening to experience.

The following rules should apply:

1. If one is to obtain increasingly better and more convincing experiments, the participants should not be changed. A certain kind of harmony develops which gradually increases the strength and scope of manifestations when the composition of participants remains the same. When the composition is constantly changing, one starts anew every time.

2. If new persons are to be introduced, these cautions need to be observed:

   a. There must not be too many at one time.

   b. All participants must be in the circle, no one should be outside.

c. Closest to the medium should be the persons with whom a harmonious relationship has been established, and only after manifestations are produced easily should new people be brought closer.

3. Initially, controls should not be too severe, as the manifestations should be allowed to develop with only the basic controls. More precise checks and controls can be applied later (maybe in a few minutes) without detriment to the manifestations. These finally become so strong and obvious on their own that they obviate the need for a whole series of snoopings, interruptions, and accusations which unnerve the medium and instead of giving more reliable results, give none.

However, I could not convince several of the doctors, who preferred to have nothing after three hours, instead of waiting patiently for 15 minutes. I had barely stated that it interrupts the medium when one of them had to look at Eusapia's teeth and check the thickness of her dress, which he kept moving away from the table, while another one checked her pulse, precisely when it would be no different from the usual one, and if it was different it would only show that the medium was irritated by the examination.

At an appropriate time all this could have be done with satisfactory results, but this idea was disregarded. Because they knew that Eusapia had a painful spot on the crown of her head, they all tried out the strength of their fingers on it, with no benefit to science. Eusapia took all this patiently, but the manifestations suffered as a result, for this kind of intervention should have been carried out earlier in the proceedings.

4. One must understand that these are not miracles but natural phenomena, subject to some limitations. These manifestations would be much more convincing if the movements of objects, touchings, etc., would occur at a greater distance, but what can be done if at a particular moment that is impossible? Why place the table 2 feet away at the outset when initially it would move at 6 inches away? Why yank the skirt away from the leg of the table if its nearness is a condition for the start of the manifestation? Why demand instantly that major manifestations occur in the light, when initially they can manifest only in semi-darkness? We would not be able to obtain a photograph if we denied permission for the film plate to be shielded; we would be unable to create electricity if we did not allow the generator to dry out, neither could we send sound through a microphone if the speaker covered it with his hand. These gentlemen feel that Nature should comply with their demands. However, I feel that they should take a look at Nature and its laws without attempting to impose their own rules.

5. Mediumistic phenomena are primarily psychological manifestations, and as such they depend to the highest degree on the psychological state of the participants, in particular the medium.

The latter must feel peaceful, be shown friendly encouragement, be shielded from strong emotions, which in the course of exteriorization could startle just like a thunderbolt landing at our feet. A gloomy sense of suspicion, derision, contempt, lack of sincerity, and antipathy are states that paralyze the medium, as they mirror the psychic state of those attending. It is true to such a degree that even the ideas existing within the group affect the character of the manifestations. In a spiritualist circle, everything takes on an otherworldly character. The simplest rap is announced as a manifestation of this or that relative. Everyone finds their friends and relatives from the other side. In a circle of agnostics and unbelievers, the manifestations are anti-religious. Circles of mystics manifest angel–lucifers, Beelzebub and his companions; among the ancient Greeks it was the gods of the Olympus who manifested, and in the Middle Ages—vampires and werewolves. In our circle, which attempted to maintain a completely objective character, Eusapia would frequently refer to John King as "questa forza" (that force), or, again, according to tradition, as "suo padre"—her father. It is therefore important that emotional influence should not be hostile, but, on the other hand, those present should not, through suggestion, cloak the manifestations with their beliefs or lack of beliefs. Lack of beliefs in the sense of doubt does no harm, but malicious disbelief, dazzling with its nihilism, frequently wipes out the manifestations.

6. Mediumistic phenomena are physiological at the same time, although they are completely unknown to present-day physiology. They possess their own physiology which in time will complement and widen the scope of today's physiology. I am certain—and this is corroborated by measurements—that the medium takes her strength from the chain of participants; when they are weak, tired, sleepy and irritated, the manifestations are weak. The weakest members of this chain benefit from it, but the medium loses much strength and tires even if there were no manifestations. Finally, some participants, for unknown personal reasons, have a negative effect on the medium although they are well and not tired. As stated by Eusapia, they have "il corrente contrario" (a counter-current), and it takes some time to bring them into the circle [slowly] without negatively influencing the demonstration. The gentlemen of the opposition were angered by this demand, which of course also raised suspicions. There is but one solution to this: Observe first, then pronounce your judgment, but they wanted to do the opposite—judge before observing. [*JO explained all this to Dr. Heryng in a letter prior to the sitting, but it made no difference.*]

Arriving at Dr. Heryng's, I find some 10 new persons, men and women, chatting, holding discussions. In the circle, also with a new participant, there is chaos and arguments. Light is placed next to the medium shining

straight into her eyes, as well as being moved constantly right and left. Also behind the curtain in the medium's cabinet there is a strong ray of light from the next room. Doors are being opened and closed. The controllers are the two people least congenial to Eusapia. The table behind the curtain was purposely placed far from the medium's back. Instead of waiting, there is constant questioning of the controllers whether anything is happening yet. Two doctors, standing outside the circle, keep approaching Eusapia and peering into her eyes. I was sickened, but decided not to intervene.

Half an hour goes by with nothing happening, and finally, irritated, they ask me why phenomena appeared within 10 minutes at the last sitting, but nothing happens now. I explain that, first, Drs. D. and H. should be asked to sit down, the light should be moved a little farther and to the side, and finally all the "viewing gallery" of onlookers should leave the room, to be let in one by one once the phenomena have developed.

Five minutes later there came movements of the table and a few impressive levitations, which caused amazement, especially as by now there were no expectations at all. The controllers swore that they were certain of holding on to Eusapia's hands and feet.

After a moment the table behind the curtain began to move. I now asked Dr. Dunin to sit next to Eusapia. She took his hand and began to pull and push the table from a distance using his hand. When she hit the main table with her fist, there was a blow on the other table, scratching here produced scratching there, etc.

Eusapia was in a fever, gave orders to an object to come, and begged those present "Ajutate!" [help!]. That was unlikely in this gathering, but gradually even the most hostile became amazed, with the exception of B. Reichman who was very unhappy.

Seeing how much effort it cost Eusapia to produce these phenomena, some asked to let her rest, but she would not and demanded that the bell behind the curtain should ring.

By then Mr. Reichman was fed up and left the room; for this reason he contradicts all the other witnesses and claims that the bell did not ring. However, it is a fact that the bell could first be heard to move on the table behind the curtain, and then to ring, as if moved by an invisible hand. Those present applauded, some expressed their admiration, people became very excited. Mr. Reichman demanded another search of the medium; others felt that that was unnecessary in view of the nature of the phenomena, but I insisted that a search take place.

Two doctors were chosen for this purpose, and Mr. Reichman joined them, and because of that I now hold a document with his signature stating that nothing suspicious was found.

After a break there was another sitting with the invited participants (as the medium was in a good mood I agreed to have everyone enter together). This sitting took place in total darkness, and the phenomena were all the stronger. The table swayed in the air, touches were felt by people at a distance, the curtain moved as if blown by the wind, slates flew in the air, and numerous little lights were seen. Eusapia was happy, and the ladies applauded.

[*There was general euphoric speech-making, with Ochorowicz being congratulated and making a speech himself. Mr. Reichman left early.*]

14 December 1983

[*They got home at 4.30 a.m. Flowers were sent to Eusapia, there was a visit to the theatre, and after returning she spent some time talking to Ochorowicz. She told him that she never used medicines, she had been ill as a child with typhoid and was in hospital, and had been told that that was when she got her head injury; she had cholera during the epidemic in Naples and recovered. She was not afraid of infectious diseases, since she often looked after sick people and nothing happened. She did not have any hallucinations, was always happy and extraverted. She loves children and is very concerned when someone is being hurt. She had a number of court cases because she would attack people who were cruel to children or animals. She hates the clergy in Naples, who are debauched hypocrites; altogether, she does not like Naples people, they are not honest. She herself comes from Calabria and only understands honesty and revenge. Her father had a little vineyard but was killed by robbers, her mother died early. She was passed along among various relatives and strangers, and was not happy, she could not get systematic work. She hates being imprisoned and sleeps until noon when she feels like it. She loves cleanliness and finds many things revolting; sometimes she feels like scrubbing the whole house; once she got up and washed the floors in her sleep; she did not remember doing it, but the neighbors told her about it. This kind of thing happened to her three times . . . more comments on her current condition and somnambulistic sleep, as well as cases involving magnetism.*]

[*More about Eusapia's state of health, very poor and therefore the sitting later not successful. They move to the drawing room and things improve, but Reichman accuses Eusapia of using a pin to lift a board (she went out a few minutes later to soak her hands in cold water, but a search revealed nothing) and the atmosphere became unpleasant. Attempts in a smaller group were better (Ochorowicz was not there), but Reichman refused to sign the report, claiming that everything was fraudulent and even though he was a controller he could not tell which hand he was holding.*

Eusapia did not understand the exchange and Ochorowicz did not translate for her, saying it was some minor issue, but she could sense the hostility. None of the other participants changed their story, and others confirmed that there had been nothing suspicious about the sitting. Reichman had not been invited to the sitting, but he had barged in claiming that his presence was needed, since he was a naturalist.

One of the participants, Dr. M., stayed behind and they tried experiments with direct writing—first using the pencil with the eraser end on the paper, then with Eusapia writing with her own fingers and theirs, leaving signs on the paper, not necessarily the top sheet; she then made a sign above the table and they could hear scratching underneath; when they looked, there was a sign there, which would grow fainter and disappear when strong light was directed at it during the drawing. This went on for two hours, and Dr. M. was amazed. There was a lot of random knocking and movements of furniture in the drawing room, which woke up JO and his wife. When they came into the room, Eusapia was asleep.] [. . .]

15 December 1893

[*Ochorowicz put Miss S. to sleep, and she told him that Eusapia did not cheat, there was no pin, and the marks on the board were left there from where it had been fixed before*.]

For a number of days a conjurer, Mr. Rybka, had been asking me to let him attend sittings with Eusapia. I did not allow any outsiders to the official sittings, but since the newspapers claimed that he could produce the same phenomena I decided to hold a sitting specifically for him to observe freely.

As for myself, I am very familiar with magic tricks and did not need to find out what can and cannot be imitated, but I thought that having the opinion of a professional magician would do no harm.

As it happened, an old friend, an engineer, arrived from Paris on that day, Bruno Abakanowicz. He also said this was all rubbish and he would have spotted Eusapia's tricks immediately. He was telling me about a new invention of threads made of quartz so thin that you cannot see them but as strong as steel, and he was familiar with how to make phosphorescent lights, so he supposed these were the means used by Eusapia.

I therefore asked Abakanowicz as well, and we sat with Eusapia being held by Rybka on the right and Abakanowicz on the left, with myself, Siemiradzki, and Miss S. farther on.

Levitations and touches started; Rybka was silent and observed carefully, having first examined the table and Eusapia's hands; Abakanowicz kept exclaiming with amazement.

After the sitting Rybka wrote for me a confirmation of the authenticity

of the phenomena. He said that some of them could be imitated on stage using certain hidden devices, but never under the conditions that he had just witnessed. Abakanowicz tried to convince me to take Eusapia to Paris and demonstrate her powers to the Academy. [*Comment on the uselessness of such a procedure.*] A few days later I heard that Abakanowicz has been telling people that it must have been an illusion and that he does not believe any of it.

As for Rybka, he later approached me asking for permission to produce a show "a la Eusapia Paladino" with the proviso that his show was different from the true phenomena, which should not be a subject of ridicule. Of course I had nothing against this, and did my best to facilitate Rybka's performances.

I forgot to add that before the sitting Rybka showed us a number of his parlor tricks, very good ones. Eusapia was frightened of him and ran away to the other room, taking him for a magician (we must remember that she is a woman of no education, and she had never seen magic tricks of excellent quality). [*A description of one of Rybka's tricks, sticking a pin into someone's arm.*]

16 December 1893

[The story of the black shawl, or an apport.]

One of the ladies at our home sitting had a black lace shawl that she hung on the arm of her chair in the dark. It disappeared and could not be found in spite of a thorough search of the room and the whole apartment. Two days later, my wife had the idea of asking the table. With my wife's and Eusapia's hands on the table, it answered: "The shawl is in this room, but do not touch it. I took it and I will give it back myself." This was not in the room where the sitting took place, but in my study. But where could it be hidden? We forgot about one place. Above the settee on the wall hung a Turkish rug in the shape of a very tall canopy. The shawl was hidden in its top pleat, which could only be reached when standing on a ladder. When I wanted to take it out, the table became angry and started to knock: "No!" So I left it where it was and waited. It was then that Eusapia remembered that when she walked through my study the previous evening something was sticking out of the canopy and waving at her. [. . . *Comment on Eusapia being exhausted and becoming inclined to use her own hands while in trance* . . .]

A short sitting in the evening after a trip to the theatre with the Siemiradzkis produced shadows against the window, which looked very much like Eusapia's kerchief, while touches also seemed suspicious, since Eusapia was busy manipulating her hands. The approach of the other table

also seemed to be done with the leg, since Siemiradzki did not have control of it at that time. I decided to let her have total rest and double my vigilance, as the next day the last sitting was to take place.

17 December 1893

[*Description of Eusapia's condition—good.*]

The sitting was good, an improvement on the previous one. Four doctors confirmed touches in dimmed light, in good conditions, and there was also writing by an invisible hand. [*Comments on JO's own feeling of disappointment with Eusapia after her tricks at the home sitting, even though he did not think they were conscious.*]

18 December 1893

This sitting was excellent, but not so much thanks to Eusapia but because of the participation of Miss S., who showed herself to be a strong medium.

I sat them at the two ends of the table; when Eusapia was weaker, Miss S. would be entranced and vice versa. It was amusing to see Eusapia's face when she first saw phenomena being produced even though she was conscious and not involved.

The sitters were Gen. Sokrates Starynkiewicz, Prus, Dr. Watraszewski, Dr. Więckowski, Jan Barszczewski (journalist), my wife, and one of the invited ladies.

The touches began on the right and were quite numerous. The General's glasses were removed. But the main events were the movements of the curtain. At the previous collective sitting, Eusapia, feeling very tired and unable to stop the phenomena herself, asked for the light to be turned on. The same happened now, the phenomena stopped immediately after the turning on of the light and Eusapia came to herself quickly. She was sitting in her place before the curtain, quite awake and fanning herself with her handkerchief. At that moment Miss S. rose, became entranced with eyes open, stiffened, moaned, and, mumbling something incomprehensible, reached out with her hand toward the curtain, which is some three steps away from her.

The curtain began to move, bulge, and every movement matched the effort of the outstretched arm. Eusapia looked on with amazement, while I got up and went to the curtain. The room was quite well lit, and light from the open door of the drawing room was falling directly on the curtain. I moved between the participants and the curtain to make sure there was nothing like a string there, but the curtain kept waving. I try to hold it with my hand and I am touched with an invisible hand through the curtain, presumably the same

hand that was moving the curtain. [. . .] The missing shawl was returned at the previous sitting involving Miss S., when it suddenly came down over the sitters' heads. However, since it all happened in the dark and Miss S. had not been searched, it cannot be regarded as a mediumistic event. [. . .]

19 December 1893

Witold Chłopicki, a well-known spiritualist, had been asking for weeks for a sitting with Eusapia so that he and his co-believers could, among other things, present her with a commemorative bracelet. I did not want her tired out before the official sittings, so the meeting took place today. It was at his apartment, and in spite of being tired and the presence of 18 new participants Eusapia produced the phenomena immediately [*the usual ones*]. At least some of them were genuine, and the whole thing went to demonstrate how much it matters to have a favorable atmosphere.

21 December 1893

[*Another home sitting, not described in detail*.]

22 December 1893

A good sitting in a small home circle, with the participation of Drs. Heryng, Watraszewski, and Wróblewski, as well as General Olsufiev and Mr. Khludov, who came on purpose from Moscow intending to take Eusapia to their spiritist circle. Numerous touches, particularly of Mr. Kh., who receives them in the spirit of a true acolyte. The large bell behind the curtain rang clearly and for a long time, and the curtain threw itself over the heads of those present; there were also strong blows on the door and the door handle was pulled, some 2 meters from the medium. There was clay on a tray, but no imprint. [*Comments on Eusapia's condition, persistent cough, and treatments.*]

23 December 1893

[*The first of Reichman's hostile articles appears in* Kurier Warszawski*; his propaganda influences others. JO does not tell Eusapia about the article*.]

24 December 1893

[*Eusapia's condition and efforts to improve it by magnetic passes, etc. Conversation about what John might do and under what conditions while she is in a hypnotic state.*]

In the evening, she was invited with us to visit Mr. and Mrs. Ś. She was

forbidden from performing any experiments since I wanted her to rest. But she did not know how to refuse, and when the ladies asked her they held a sitting in secret in a side room. It did not stay a secret, and Mrs. R. told me in confidence that she caught Eusapia cheating. Mrs. R. was holding Eusapia's left hand, Miss K. her right, then the neighbor of the latter, Miss J., was touched. Mrs. R. says that Eusapia did it with her right hand, because she saw the movement of Eusapia's hand and body, and immediately after she touched the hand of Miss K. she found that Eusapia's hand was not on it. However, Miss K. claims that she felt Eusapia's hand on hers all the time. [*Most likely simple cheating, perhaps unconsciously, perhaps it was the material hand that touched Miss J. while the mediumistic hand stayed on; or the most likely thing is that Miss K. imagined she still felt Eusapia's hand on hers. The women were laughing, screaming, and altogether were not serious, so Eusapia may have entered into the spirit of that.*]

News of this incident spread and others insisted on making Eusapia show something genuine. She sat at a small but very heavy table, with two men at her sides. Levitation happened very quickly, but Mrs. R. thought it was suspicious because she noticed that the medium moved her right leg back, as if to support the table leg. I also saw that move, and asked Mrs. R. to kneel and hold Eusapia's feet to the floor with her hand. She did so, but another levitation took place. I repeated the experiment and while I felt her knee move as if an effort was being made, there was no question of support.

Encouraged by this success, John demanded that the light be dimmed in order to produce touches. Then the ladies started screaming and squeaking, because Eusapia would take every person in turn by her two hands, and then there would be touches on their faces, necks, backs, etc. One of the ladies who kept insisting it was all an illusion wanted to experience it herself and grabbed both Eusapia's hands. She was then touched on her neck by John's hand so clearly that she screamed and dropped Eusapia's hands. This caused the medium to scream and become very agitated; she was undoubtedly entranced and the sudden interruption left her semi-conscious.

25 December 1893

[*Comments on Eusapia's condition and the effects of magnetic sleep. In the evening there was a sitting that was the worst ever. There was no trance, a few probably genuine phenomena among a flood of suspicious ones*.]

I am the controller on the right, Dr. Gościski on the left. The medium's legs are tied to ours, so that we feel her every movement.

On the table behind my back are scales in a glass container and before it a tray with clay. After initial movements and levitations, Dr. G. feels that the knot on the left string has somehow been untied, and at the same time a

shoe dropped on the table. Just before that we both felt as if the string that tied Eusapia's feet was being pulled by a hand. Eusapia's feet were at rest, and we were holding her hands—and a moment before Dr. G. noticed that the left foot was already bare. Before the shoe was thrown on the table, M. G., who held his hand on Dr. G.'s hip, was touched on it either by the shoe itself or a foot wearing one.

At the same time, there were movements of the curtain, which touched Dr. G. a number of times, while at the same time he felt an effort in that direction from the medium's hip. There was no imprint, no movement of the scales, and no lights.

Having examined the knots, which remained untouched on my side and the undoing of which on the left remained a mystery, we moved to the drawing room.

Myself and Prus were the controls; he adheres to the principle, very favorable to cheating, of not holding on to the leg or hand when it slips out; and since it is easier for the medium to produce phenomena with her material hand rather than a mediumistic one, we get a whole series of suspect phenomena. On Prus's side we obtain an imprint in clay, probably produced by the medium's face, since I felt her body move to the right toward the bowl. John complains through Eusapia that the clay is hard and the imprint is weak. [*In view of the imperfect control, this phenomenon cannot be taken into account, the most likely explanation is that Eusapia produced the imprint with her own face.*]

After this suspicious imprint, there was a 20-minute break in the phenomena, then the table jumped up and moved toward the scales. Eusapia stopped in front of the table with the scales, with her back toward us. Prus again let go of the right hand, which meant that I watched even more carefully the movements of the whole body, and I have no doubt that first the table with scales was lifted by Eusapia's right foot, in order to make the scales sway, and since that was difficult because I was pressing the tabletop down with my fingers, she simply opened the glass cabinet (I left the key in the lock, which was locked, and afterwards was unlocked) and got them moving with her finger. I'd had enough and stopped the sitting.

I did not speak about it to her as yet, but she is aware of the doubts and it upset her. When I ask her whether she remembers what happened at the sitting she claims to remember everything, which is strange because normally she knows nothing. She claims that something took off her shoe and threw it on the table, that something was pulling her toward the clay, and that she felt that she must find a way of moving the scale, but does not know how it happened. She complains that the suspicions had a paralyzing effect from the beginning—but then the phenomena were unusually suspicious.

26 December 1893

I see little of her during the day. [*Eusapia is out with JO's wife.*]

After they return from the theatre I do an experiment with moving the scales, naturally with the light on. We sit for two hours—after an hour there is a cool breeze between her hands and the scales and then they begin moving. After half an hour another breeze but no movement. I stop the experiment and still say nothing about the suspicions. I do not magnetize her to sleep at night.

27 December 1893

She sleeps badly, dreams that the money from me, in the bank, was lost, and she could not pay her rent. (Interestingly, a month later, when she tried to withdraw money transferred for her to Banca Romana in Rome, she learned that the bank collapsed the day before and suspended payments. Myself and Siemiradzki succeeded in moving the transfer to another bank, but because of the delay she could not pay her rent and had to ask for an extension.)

I said nothing to her about the suspicion of conscious fraud—and just as well, because it would have upset her and the phenomena, whereas after a rest we had an excellent sitting in a small circle. I decided not to invite any new participants so as not to spoil the phenomena. [. . .]

For the first time I placed the table sideways, to better control both her legs and the table legs. There were no levitations, but the table made various movements and rose partially, with no suspicious incidents—she did not touch the table with her legs, and only lightly or not at all with her hands. I then returned the table to its usual position. Eusapia sat at the narrow end, held by her hands, while I lay under the table on the carpet (the table was on the carpet in order to eliminate sliding movements) and held both her legs.

Nothing happened for a while. Then I noticed movements in the left leg, aimed at freeing the foot from the shoe. The foot was halfway out of the unbuttoned (as usual) shoe. When I touch her ankle she complains that it hurts. I take off both her shoes and hold her legs through the stocking, in such a manner as to be aware of every movement but not to restrain it. After a moment the left leg began to move toward the left leg of the table; it became cool, it touched the table leg; it then returned to its previous position and the levitation took place at that point. Her hands were touching the tabletop only lightly.

There were also many touches in good conditions. Finally we got a face imprint at a time when I felt all of her next to me. During the imprinting she was clasping me convulsively with both hands, and pressing her temple to mine, her head vibrating with effort. She exclaimed that the clay was very hard.

When we turned on the light, we found an imprint of a face, similar to the previous one, in the clay, which stood on the right side of the medium (I sat on her left). However, there was no trace of clay on her face (and I am certain that it did not come into contact with the clay). Eusapia was very pleased after this, and it seemed as if John had used all his efforts to convince us.

It is worth noting the following:

1. Miss S. was directing the proceedings while in magnetic sleep: She decided who was to sit where, forbade the use of Italian, demanded control reports in Polish, pretended that we were singing, told us what would happen next [. . .]. There were two interesting incidents regarding speaking exclusively in Polish: At one point Eusapia, entranced, started singing to a tune from an opera, in Polish, mocking our controls: "Now I hold the knee but the foot disappears," etc., demonstrating that she saw through our subterfuge.

2. I also discovered directly that in trance she read our thoughts, although we spoke in Polish, since John gave accurate answers to questions in Polish. I initially thought it was because of Miss S., but when I told her to move away from the table altogether, John continued to understand us. [. . .] I also learned that Eusapia can see in the dark; in total darkness I took 30 cards from my pocket with numbers printed on them and taking one at random I put it on the table. John knocked seven times, and it was a seven. But when the number was face down and covered with a hand, he could not guess it.

There were no lights.

When we finished the sitting, I took the tray with the clay to the dining room where there was a lamp on the table, in order to examine the imprint. We looked at it from all sides, while Eusapia stood leaning with her hands on the table, as if unconscious. I was watching her carefully. She stared at one point, unseeing, then, swaying, returned to the study. We followed her, while the clay remained on the dining room table with the lamp. Eusapia stood motionless for a while, then she turned back toward the door, without crossing the threshold. She stood there, leaning with her hands on my bookcase. Through the open door we saw the tray with the clay on the table, together with the lamp. Eusapia seemed to be staring at the clay. After a moment she stretched her hand toward it, moaning with pain, and then fell against the bookcase almost totally limp.

Assuming that a phenomenon must have taken place, we went together to the dining room and, to our amazement, on the tray that we had examined a moment ago and which undoubtedly nobody had approached in the meantime, we found next to the imprint of a face a deep imprint of a hand,

pushed into clay with great force, as if wanting to pull some of it out. The imprint was very good, and as usual as if through some thin fabric.

We go back to the study, where Eusapia was still standing unconscious, wanting something but still unable speak.

[*JO takes her to a table and through knocking hears from John that "I took the medium's money" (in Italian). JO finally guesses that this concerns the money meant for Eusapia, which was in an envelope in JO's desk. JO looks everywhere and cannot find it. Finally John admits that it is in the wardrobe in the bedroom— hidden behind the shelf. JO had seen the money in his desk that day in the morning, the drawer was then locked and he had the key with him until the evening. It is thus possible that Eusapia did it then, but the others claimed that she never entered the bedroom*. . . .]

27 December 1893

[*Description of Eusapia's condition; they then compare the cast of the first [suspect] clay imprint, which JO had hidden, with the latest, but it is in pieces. They have a long conversation about the suspicious phenomena, with Eusapia upset and swearing she is not aware of having cheated. JO comes to the conclusion that she is sincere, and that her cheating is unconscious.*]

28 December 1893

[*Household activities, Eusapia cooking Neapolitan dishes for herself. The next sitting is to be aimed at producing a materialization, i.e. a "spirit," the medium's double*.]

29 December 1893

Apart from the household, there were Drs. Gościcki, Higier, Mayzel, Więckowski, and Witkowski, as well as Messres Kraushar, Matuszewski, and Święcicki. Prus came but left before the second half.

We put Eusapia on the settee, having carefully dressed her in my wife's clothes, and tied her to the settee so thoroughly that there could be no possibility of getting up. One end of the tape was sealed, the other was held by one of us. [*The settee was surrounded by a curtain with an opening in front. Eusapia could not become entranced after an hour, asked to have her hand held; then Miss S., entranced, claimed that there was not enough power for John to materialize and said something else would happen. On Miss S.'s instruction JO brought the table to entranced Eusapia on the settee, everyone could see she had no contact at all with the table, and the controllers sat on the settee with her, each holding a hand and a knee, with sufficient lighting, and nobody's hands on the table. There were a number*

of full levitations of the table that was not being touched by anyone. During levitations they could feel the effort of her muscles, and, still entranced, she jokingly demonstrated lifting her feet (all visible and away from the table) while the table levitated. . . . speculation on whether suggestions make a difference to the phenomena, and how far trance and hypnosis are different states—according to JO, not enough evidence for firm conclusions,] [. . .]

30 December 1893

[*Description of Eusapia's condition, effects of hypnotic sleep and effects of Eusapia's menstruation.*]

In the evening, at supper, Miss S. says that she feels something funny that is going on in the drawing room, but I looked in there and all was quiet. An hour later the servant went into the room on my wife's instruction to cover the clay with a wet cloth, and found an imprint of an ear and, less clearly, a whole head . . .

My wife immediately made a plaster cast from that mould and having finished it, left it on the table in the dining room; when she returned a moment later, she found it broken in half, together with the clay, which would have needed tremendous force. Perhaps John did not like that imprint. I cannot be sure, but I do not think that Eusapia entered the room during that time. [. . .]

31 December 1893

[*Eusapia's condition, experiments with a dynamometer measuring the weights of the table with Eusapia's hands in different positions; the feet were always visible, and the dress nearly always bulging. These were followed by tests of direct writing, with Eusapia's finger (strokes appearing), and JO's and a visitor's fingers held by Eusapia (strokes appearing on paper and on the table underneath). Later, in the dark, signs were obtained on sealed slates hung on the back of the medium. There were also levitations of the medium onto the table, with the hands and legs well-controlled; touches, and a special demonstration by John for JO, with Eusapia's hand clasping his hand almost painfully, while at the same time he felt his forearm being clasped above the elbow, with fingers that felt exactly like those of the hand that was clasping his hand. . . . To further convince JO that it could not have been Eusapia's other hand (which the controller claimed was well-controlled throughout), Eusapia stretched her hand straight to the side, JO moved away, and at the same moment he felt the same clasp above the elbow. It would have been impossible for the material hand to stretch that far. This is followed by a long conversation with "John," who, among other things, offers to provide theoretical explanations for the various phenomena. This*

is followed by a levitation of Eusapia, together with her chair, as promised by "John." The interesting point is that the "experimental lesson" largely reflected JO's own suppositions, which he had never discussed with Eusapia—with her he never questioned the reality of "John" so as not to disturb the routine she was comfortable with. . . .]

1 January 1894

[*Visiting Prus, whom Eusapia adored even though they had to communicate without much language (she would jump for joy when "il Prusso" came in*).][5]

2 January 1894

[*Further treatment of Eusapia's condition as recommended by John. Visit to the theatre.*]

3 January 1894

[*Eusapia decides to prolong her visit to let JO finish his experiments. An excellent sitting in a small circle. John was supposed to light an electrical lamp prepared by JO. This was a box with four Grenet elements, and a lamp that would be lit by pressing a spring button which released the chemical mixture to light the lamp. This ensured that it would be impossible not to see the hand pressing the button, which had to be held down, as well as lighting the medium. Everyone sat around the table, Eusapia with her back to the curtain behind which stood the box. Eusapia's hands and legs were held by Ochorowicz and Święcicki, and the room was lit by a dimmed lamp in the corner, which clearly showed the contours of the people. There were no other phenomena, just a few touches*.]

The phenomenon started by the sound as if someone was opening and closing the door of the box, and trying the button, but only lightly. Then the whole box [*heavy, full of liquid*] began to slide parallel to the medium's back, behind her chair, to the other end of the curtain, a total of 1.5 meters.

That movement would have been totally impossible for Eusapia, even if both her hands and feet were free. She would have had to get up, but we saw her among us throughout. [*Neither her hands nor feet could have reached that far.*] When the lamp was moved to the edge of the curtain, we saw the following manipulation:

Some invisible hand (a leg could not have done it) began moving the curtain so that the lamp should be in front of it, and the button behind it.

In this manner, visible in the light of the lamp standing on the floor, the invisible hand succeeded in turning on the lamp while the hand pressing the button stayed behind the curtain.

When all was ready, we heard the spring tighten, the button was pressed, and the light came on, illuminating the medium and all of us. Spontaneously we shouted, "bravo!" The light stayed on a few seconds, then the spring jumped back and the light went out.

I turned up the dimmed lamp telling Eusapia not to change position, I measured: the distance from Eusapia's waist to the button—1.16 m; from the end of Eusapia's right leg to the lamp—1.36 m.

I then told her to turn toward the lamp in the chair and stretch her leg as far as she could. The distance between the top of her foot and the button was 38 cm.

The turning on of this light was repeated once in the original position of the box; twice halfway, i.e. behind Eusapia's chair, and three times at the greatest distance to the right, at the edge of the curtain. John seemed to enjoy the experiment, because he kept repeating it without being asked.

Strangely, when I put the box in front of the medium on the table, it became more difficult to light the lamp. First the curtain was thrown over the lamp and the medium's hands were being held by us, and only then did the lamp come on, but not for as long as previously. Eusapia was clearly suffering from the light shining directly into her eyes.

The second episode involved my cane. John started making noises in different areas of the room, hitting the glass of the bookcase, the floor, and the glass lampshade on the ceiling. The sounds were impressive, but John had taken my cane from its place by the mantelpiece when the table was moving that way, and so the noises did not come from beyond where the cane could reach. On the other hand, nobody was even touched by it in spite of this being done in the dark.

[*Description of the workings of the radiometer.*]

The radiometer, which stood on the table, was lifted, handed around, and taken away by an invisible hand a number of times. When, after the light was turned on, I wanted to put it away [. . .], I could not find it anywhere. When we were going to bed, Eusapia came in to say "good night," but she looked semi-conscious, and was holding a folded kerchief as if carrying something. She shook it out toward my bed and there was nothing in it. In the same state, she went back to her room, and I thought nothing of it, thinking she had been wishing us a good night. However, in the morning, looking for my wallet, I found the radiometer, unbroken, under my pillow. [. . . *JO also carried out an experiment with the scales while Eusapia was in that state, and she succeeded in moving the rod of these extremely sensitive scales.*]

4 January 1894

[*Day of rest.*]

5 January 1894

[*A sitting in a small circle with one additional participant who had not attended for some time, J. Matuszewski. Phenomena weaker and harder to achieve; according to JO because J. M. lost the bond with the circle (although convinced of the reality of the phenomena), and because Eusapia drank a lot of water beforehand. Discussion of the influence of the "magnetizer" and some contradictory results. The results of the sitting included very brief lighting of the lamp by pressing the button; and JO and J. Matuszewski saw a profile of John's face with a beard and not quite fully formed hand against the window. On a number of occasions the participants were touched by what felt like a beard, but no false hair had ever been found. . . . There were also some blows as if of a fist on the table, under good conditions*.]

7 January 1894

[*Description of Eusapia's condition, poorly in the morning, then improving. Successful short sitting after supper, with a number of new persons, with levitations of the large, middle, and small table, the bell ringing twice, a miniature table rose and was pulled four times. All the more strange that it should have ended with a tangle of suspicions very difficult to resolve. Ever since Reichman implied that Eusapia was doing everything with a hair which nobody saw, JO was even more careful to investigate any possibility of such tricks. Reichman did not claim he saw that hair, but his descriptions implied that this must have been the case. JO is certain that this would have been impossible, but admits that Eusapia had a habit of picking at her hair (without pulling it out) and playing with it, including single hairs, which could have given rise to suspicion. JO also had asked Miss S. to help with observing Eusapia and to report everything that might be relevant to him. This never revealed anything suspicious about Eusapia's behavior; also, she hardly ever knew what the next experiment was going to be, since JO was following his own plan of which nobody was aware. Originally, Miss S. and Eusapia were very friendly, but later there seemed to be a coldness between them*].

Miss S., an excellent hypnotic medium, was used to my paying a lot of attention to her, but during Eusapia's visit I had to neglect her somewhat. I also, for a variety of reasons, mainly to do with the family, did not want to encourage her spontaneous mediumship. I felt that she resented this, perhaps unconsciously, and resented Eusapia, who was the focus of

everyone's attention.

On that day Eusapia was wearing a white dress, made especially for the occasion [*JO's nameday*]. During the experiments with the bell I thought I saw a hair on her knees, but since I was carefully watching her hands I did not attach much importance to it. After four successful trials with the bell and the miniature table, I moved away from the table together with Matuszewski, who told me he saw something like a hair, not in Eusapia's hands and not during the experiments, but on her knees. At that moment the miniature table rose up, with us at a distance, and Miss S., who stayed there and whose attention was drawn to our whispering, came up to me and told me she "saw a hair"—not saying under what conditions, but insisting that she "saw a hair."

I did not want to discuss this in front of Eusapia. [. . .] Taken to one side, Miss S. insisted that the first four experiments were genuine, but the fifth, carried out not in my presence, depended on using a hair. "Did you see the hair moving the table?" "No, but I saw it in her hand and I could swear she was moving it." [*JO determined to get to the bottom of this.*]

8 January 1894

[*Unpleasant atmosphere; Eusapia irritable and cross with everyone in turn. Miss S. confirms in magnetic sleep what she said previously, with the same insistence and what seems like pleasure in having discovered fraud. At the same time, Eusapia, not told about anything but aware of JO's change of attitude, is becoming unbearable and is preparing to leave. The atmosphere lasts the whole day.*]

9 January 1894

[*No change in the atmosphere, so JO invites Eusapia for a long talk in his study. He does not tell her about the suspicions of Miss S. and Matuszewski, and says that he may have been colder toward her because he noticed suspicious circumstances. Eusapia swears she knows nothing, denies cheating, and cries throughout the interview. He puts her to sleep and in that state she says that the hair came from the fur she was wearing, and is still on the dress, indicating the position. This turns out to be the case. However, Miss S. claims that the hair was different, Eusapia's own, and on the other side. JO is annoyed at not being able to resolve this. He tries to induce a clairvoyant state in Miss S., who then claims that the hair was created by an invisible force and, seeing that she was holding it, Eusapia flicked it off, so it was not on purpose but nearly so——etc. JO gives up. Perhaps it was a materialization of a hair.*

Eusapia tries to ingratiate herself, and has a go at reading a newspaper with her eyes covered, with mixed results.]

In the evening there was a very interesting sitting with new conditions. So far we always used a table because Eusapia claimed it was necessary, but this time I wanted to see how John would cope without it. [. . .] We sat in a circle, holding hands, Eusapia with her back to the curtain, behind which at a distance stood the table. Miss S., entranced, gave directions; I held her one hand, Eusapia held her hand on the left, farther on were Święcicki, Prus, Matuszewski, my wife, and my wife's sister. At first we put a chair in the middle, but Miss S. told us to remove it. She also told us that Matuszewski should enter the circle gradually, that we were not to ask Eusapia any questions, not to break the chain, and to cover the lamp with purple paper. [. . .] John, unable to knock on the table, began to knock on Eusapia's chair, and even though the sound seemed to come from the back legs, I removed Eusapia's shoes and put them to one side, since such sounds could be produced with a heel. However, the knocks continued while the lamp in the box with the battery (on the table behind the medium and the curtain) came on two or three times, but not as easily as at the first sitting. It then was invisibly moved 1 meter farther away but the lamp could not be turned on.

We were now supposed to witness the promised materialization of John's hand. After a moment, the curtain began to vibrate and from the opening above the head of the medium emerged something resembling a hand which immediately drew back. It was a human hand but a small one, almost a child's. A moment later a full man's hand appeared, and then a small woman's hand, holding a snow-white handkerchief. At the same time I was certain of holding the medium's left hand and the other controller the right, both hands being visible on her knees.

The mysterious hand appeared five or six times, sometimes for long enough for us to examine it carefully. Prus, who is shortsighted and sat farthest away, asked to come closer. John agreed, and Prus came and stood close to Eusapia, holding on to her left hand which I was also holding. Prus asked if he could hold the phantom hand, and permission was given by three knocks behind the curtain.

He put his hand in the opening in the curtain above Eusapia's head and the mysterious hand—according to him, the left hand—took his hand and clasped it. As has been mentioned, we were both holding Eusapia's left hand; almost at the same time I was touched on my right hand, resting on Prus's shoulder.

[*In response to questions, John explained that the larger hand was his, and the smaller one belonged to the medium's mother. . . . There follows*

a conversation with John regarding the possibility of holding another collective sitting, followed by all the men holding Eusapia's legs and sounds of blows being heard on the table behind the curtain as she hits her heels against JO's knees. There was no imprint in the clay standing on the table. Two imprints of John's larger hand were obtained, but nothing conclusive can be said about it, apart from the fact that some of them were undoubtedly obtained from a distance, and that the imprints of the face and the hands were those of a living face and hands.]

10 January 1894

[*Eusapia goes to the theatre with JO's wife.*]

11 January 1894

[*Second day of rest with a somnambulistic episode. Eusapia went to bed first, but when JO and his wife were in bed but not yet asleep, the door opened and something was moving the drawer in his wife's dressing table next to the door. In the drawing room, JO finds Eusapia asleep; when awoken by his voice she denies that she had been up. The next day in hypnotic sleep John tells JO that Eusapia forgot her nightdress and as she could not find it she went to get matches from the dressing table. When she heard movements she ran back to bed and continued to sleep, knowing nothing about what happened.*

In the evening JO wanted to demonstrate a number of electrical devices for controlling the medium's hands, feet, and hand pressure. However, one of the devices turned out to be impractical and needed redesigning. The other one, where the feet were placed in separate containers and an alarm would come on if lifted out, worked, but the table coming down after levitation cut the wire to the battery. After repairs, there was a high levitation, with a photograph showing Eusapia's feet in the containers. JO wanted those invited to see "John's hand" but it appeared only once and not clearly. The electrical lamp came on a few times, but only behind the curtain. Dr. Więckowski was touched by a hand which JO could see coming out not of Eusapia's arm but from the opening in the curtain. While they were in the drawing room, an imprint of John's face appeared in the study behind the curtain, but unfortunately the controls were not good. JO complains that it is impossible to teach John how to perform a proper experiment.]

12 January 1894

[*A sitting at Święcicki's apartment, with Eusapia very cross beforehand for being made to hurry, as well as falling out with Miss S. JO worried*

about the sitting, but it seems to benefit the phenomena, which came quick, energetic, and clear, especially as they start in the dark (although some light comes from the window)].

1. The battery together with the lamp were moved from behind the curtain onto the table in a very impressive move, because you need two hands and great care not to spill the liquids.

2. Myself and Dr. N. saw John's head against the window, emerging from Eusapia's side but above her.

3. Dr. N. was touched under good conditions while holding Eusapia's left hand and leg.

4. The bell behind the curtains rose above our heads and rang.

5. The folding table behind the curtain slid and rose without being touched.

6. The electrical box was lit on the table in front of us, with Eusapia's hands being held by Dr. N. and Mr. W. B. and with Eusapia leaning her head against Dr. N.'s.

7. A number of table levitations after the light was turned on.

8. Imprint of two faces in the clay, after the sitting ended.

[*After the sitting, when they were entering the dining room, Eusapia turned back and stood in the door, again in trance, staring toward the curtain behind which stood the clay. On seeing JO, she took his hands, leaned her head against his, moaned, pressed, and finally said, "It is done." They went behind the curtain and found two faces imprinted next to each other, similar to the previous ones and to Eusapia.*]

13 January 1894

[*Bad day; Miss S. hurt herself badly running up the stairs in the dark, while Eusapia had a dizzy spell when out, fell on ice, and dragged herself home, with stomach spasms and a hurt thumb. JO magnetized both. Reichman continues his insinuations in* Kurier Warszawski*, and the post brings an anonymous letter threatening public insults unless JO renounces recognizing mediumship*.]

14 January 1894

[. . .] By the evening Eusapia is well and we arranged the final sitting, at which John went out of his way to leave us happy memories of him.

We get clear touches by a hand while using electrical control of the hands. The principle is this:

Contact between the hands of the controllers and the hands of the medium closes an electrical circuit, but only when each holds a different

hand. If a controller lets go, or if Eusapia were to try a substitution, the bell would ring. Eusapia was in an excellent mood and laughed heartily when a controller made the bell ring by letting go of her hand.

The touches were mostly on the right. Święcicki was touched three times, clearly with five fingers, and with what seemed like a leg. Prus also was touched as if by a leg and then by five clear fingers. I was also clearly touched once with a hand while holding my hand on Prus's shoulder. [. . .] We take off the device and I myself take both hands and both legs of the medium. In these conditions the little three-legged table from behind the curtain moves above our heads, stands on the table and knocks twice three times, which means a double yes.

We then sat down as usual and heard voices through a paper tube on the table and held by me, 15 cm from Eusapia's mouth, while Święcicki controlled her head. [*There were a couple of phrases in Italian, but better ones had been obtained in Rome and in Warsaw.*]

Now comes an interesting experiment by Prus. Since we had no lights for a long time, Prus, saying nothing to anyone, wrote down in his notebook that he wanted a light to appear today. And there was one, similar to the previous ones, like a miniature falling star.

We then obtained a face imprint under good control conditions, and at the end John embraced three people sitting close by. There was a hug with the hands and a kiss that could be heard and felt. [. . .]

But the most interesting point was the clear levitation of the medium beyond the table and in good control conditions.

Eusapia stood in the middle of the room, with her hands held by me and Matuszewski. Her feet were bare. Suddenly she started to rise, first on her toes, then with her hands on the edge of the table, then fully upward without any support. This was interesting because it demonstrated a number of transitions from mechanical phenomena to purely mediumistic ones. Rising on one's toes and leaning on the table might be regarded as involuntary cheating, since this was undoubtedly mechanical support. But when Eusapia's feet stopped touching the ground the mediumistic phenomenon joined in, since a person cannot rise slowly above ground when leaning on the edge of a table—one can only jump up and fall, and here there was no jump, just slow rising.

Finally, when Eusapia rose fully in the air and was no longer touching the table with her hand, we had a purely mediumistic phenomenon, since holding our hands for control could not provide mechanical support in the rising; it may only have helped with the balance.

This gradual levitation took place four times and lasted sufficiently long for me, without letting go of Eusapia's hand, to check with my other

hand that she is totally above the ground at a distance of about six inches. I imagine it as the double lifting of the medium with its hands, because the impression was as if someone was standing behind Eusapia and supporting her under the arms. [. . .]

[*JO asked John whether they would meet again; John thought it might be in Warsaw but in fact it was six months later on the island of Roubaud.*]

The next day Eusapia went on the night train directly to Naples, having been given warm clothing, and lots of sweets and flowers. She cried as she hugged everyone seeing her off.

Throughout her stay in Warsaw I would go to bed about 3 or 4 a.m., and get up at 8 or 9. I never had a moment's rest during the day, since I was seeing patients and I would not go to bed until I wrote up the day's notes. Not to mention the innumerable letters, telegrams, visits, and requests to be admitted to the sittings. And to top it all, every stupid newspaper felt entitled to insult me, while the jokes and calumnies which came my way in private would fill a sizeable album if I had not thrown them in the bin. But I have done what I meant to do. The Warsaw experiments, even though they could not lay claims to scientific strictness, awoke interest here and abroad. Here and there scientists are beginning to consider the matter and there is hope that the question of mediumship will become a scientific question in the not too distant future.

Conclusions Drawn from the Warsaw Experiments

Personally, I gained much from the Warsaw experiments. First of all, belief in the reality of the phenomena was confirmed in my mind. Next, my general outlook on the issue became clear. Finally, I could analyze some of the manifestations with greater precision. I present the results divided into two categories: general and specific.

General Conclusions

Mediumship vs. Spiritualism

In Rome, although to start with I might have had the impression that mediumistic phenomena indicated that the soul was immortal and the dead were participating in them, and although initially this might have been the impression in Warsaw, on closer examination I found the spiritualist hypothesis unnecessary and groundless. One would have to be exceptionally credulous to accept that the active force was "John King" or some other entity.

More recent studies of hypnosis have brought us better understanding of certain aspects of mediumistic manifestations. Antagonisms between the

personality of the person being hypnotized and its personality in trance can go further than the antagonism between two similar personalities. It is to the credit of the old magnetists that they determined this distinction in pure magnetic sleep and various forms of ecstasy.

For its part (thanks to Richet and his successors), the more recent hypnotism made this manifestation known and popular through experimental calling up of various personalities through suggestion. Therefore, if in trance (a unique form of hypnosis) the same antagonism occurs, whether consistently or on a variable basis, this cannot be considered to be proof of participation by various persons. One would need very positive data excluding spoken or mental suggestion in order to justify the spiritualistic interpretation. In the course of my experiments, I found no such proofs.

What John King said about himself (and he said very little on that score) was merely a reflection of involuntary or purposeful suggestions gathered in Eusapia's mind in the course of her mediumistic career. Under the influence of stronger sensations (be they internal or external, such as pain or thirst), the separateness of John would evaporate instantly, blending into the personality of the medium. He did not manage to extract from her even one indicator, be it in writing, piano playing, gestures, or spoken word, which would be a departure from the medium's personal symbolism. Even the markings made over a distance were always the kind of scribbles made by Eusapia when playing with a pencil or gesticulating with a finger. His feelings and sensations did not go beyond the scope of the medium's feelings and sensations, although at times they were at odds with each other: And John himself, although he spoke of Eusapia's intelligence in a pitying tone, nevertheless never said a thing of a clever nature himself.

One minor superiority is based on a somewhat better awareness of phenomena occurring during the trance, rather than in the conscious state. This, however, can be fully compared with an analogous characteristic of magnetic sleep. In both instances there is a high degree of apperception and critical discernment, as a result of isolation from external stimuli. It is also only within these limits, with the addition of a number of subtle stimuli that are not known in the conscious state, that seemingly miraculous trance clairvoyance occurs, which is not of a higher order than somnambulistic clairvoyance. Both had a deeper awareness of the condition of its organism. Both of them made mistakes or would fade in vague descriptions that merited a degree of trust only where they concerned the needs of their own organism.

Attempts to transfer another "spirit," named Lucyan, to our group, did not succeed. Manifestations of John without Eusapia also failed. Once, however, it seemed that John wanted to give us proof of his identity. At one

of the séances he announced that there were also other spirits present. This happened as a result of my unintentional suggestion, for being touched at a greater than usual distance from the medium, I asked John whether it was he who touched me, or someone else. This got John claiming that it was my mother's spirit. This notion entered Eusapia's mind as I had shown her my mother's picture on that very day. Later, at the session, one of those present mentioned that the touches were somehow more delicate, as if with a smaller hand than usual. Finally, the presence of my cousin, Miss S., may have contributed to the answers given by the table.

'If it is my mother's spirit,' I said, 'let it then touch one of those present whom she knew during her lifetime.'

After an answer confirming that she would do it, Święcicki was touched, whom my mother did not know, but Prus, whom she knew perfectly well, was passed by. No one present knew of this, except Prus and myself.

If I were somewhat less questioning, the touching and knocking would start in accordance with the hypothesis that my mother was present, and I would confirm her presence by a number of carelessly worded questions. This kind of situation has arisen not once but a hundred times in my presence at various spiritualistic séances. I did not find proof of identity of the spirits at any of them.

The Warsaw experiments reinforced my stance as an observer acknowledging pertinent facts, but in interpretation I am not and never was a spiritualist.

Phenomena Are Medium-Dependent

There are so-called "spirit phenomena" without the presence of a medium. Although here and there one reads about "haunted houses," where certain manifestations occur even though there is no one present, whenever I wanted to investigate the phenomenon either there was no occurrence, the claim was fraudulent, or a medium was present. A simple analysis will suffice to see that if there is no one present, there is no witness, and where there is one, the witness himself can be a medium. Possibly in the future I will come across facts that modify my outlook, but for the time being this is my position.

The medium-dependence of spirit phenomena is obvious and unconditional. Mediumistic phenomena take place at the expense of the medium and under the direction of his/her thoughts, mainly unconscious, but which do not extend beyond the limits of the medium's memory. They only occur within a short distance from the medium, greater when the conditions are favorable, lesser when the conditions are not so favorable; under very bad conditions they do not extend beyond the medium's body

surface, which is when they look like fraud, or are involuntary fraud if one excludes the possibility of conscious fraud.

For a mechanical manifestation, the greatest distance from the medium's body that I have seen thus far does not exceed two meters, when measured from the central position (later studies confirmed a considerably greater distance—up to ten meters).

The mechanical force active in manifestations may exceed the medium's normal strength, but not the abnormal force in trance, in a sleep induced by magnetizing or suggestion. However, it never exceeds the strength of an average man. Only the lack of a visible point of resistance may create the illusion of yet greater strength.

The nature of movements manifesting at a distance always corresponds to the nature of the movements of the medium, and may be modified only to the degree that its individuality can be modified under the influence of suggestion. Their nature does not go beyond that which could be achieved by an invisible person, etheric, penetrating material bodies, and endowed with medium strength and intelligence.

There is a most precise link between the condition of the medium and the manifestations. A medium who is ill, exhausted, sleepy, or morally despondent produces weak manifestations or no manifestations at all.

Large quantities of food and drink, water in particular, prior to a session, have a paralyzing effect. The same holds true for the freezing of hands or excessive heat. In other words, such things scatter the medium's concentration. On the other hand, a good state of health, strength, sufficient sleep, cheerfulness, irritation, and sometimes even nervousness or anger, have a positive effect. A simple life, moderate warmth, and concentration of attention have a similar effect.

Sweating, if I am not mistaken, has a certain physiological connection with the manifestations. It always occurs, and is followed by great thirst. What needs to be explored is the possibility that bringing forth mediumistic manifestations increases the electrical resistance of the medium's body.

In no way can mediumistic manifestations, or the hypnotic ones, be considered pathological, although both do sometimes occur in some illnesses. Mediumistic manifestations, to a greater degree than the hypnotic ones, demand health and strength, which decrease as a result. They can occur even more powerfully in certain states of nervous breakdown that exhibit excitement.

A mediumistic session—in contrast to the effects of hypnosis—is always exhausting and demands a rest afterward. I know a professional somnambulist in Paris who for the past thirty years has daily been put into a trance, at least a dozen times a day, and who is exceptionally healthy,

whereas spiritualist mediums who experiment without appropriate supervision frequently end up as victims of neurasthenia, paralysis, or insanity. Fortunately, magnetizing and hypnotizing in conjunction with the knowledge of conditions of this physiological category of manifestations gives us the opportunity to experiment without harming health.

Mediumistic manifestations exhibit greater strength in trance state than in the conscious state. The latter state must be considered as a conscious state intertwined with a transitory trance state, and it manifests in the course of entering the state of deep trance. The transitory phase then passes.

The greater the strength of a manifestation, the greater the lethargy of the body. When there is a complete materialization of a double, the medium lies as if lifeless. When a hand manifests some small phenomenon, it becomes numb; when voices manifest, the medium loses her voice; when the table gets lifted, as if by the knees, they begin to hurt and get strained, although they lifted nothing; when the hand of the double is pricked with a pin, the medium feels it; when the manifestation is difficult the medium's body loses its thermal reaction and a cool breeze can be felt emanating from the head, after which there remains a headache and exhaustion.

In general, pain accompanies all major manifestations, and in order to avoid it the medium attempts to help herself unwittingly, mechanically, producing unconscious fraud. Artificial reduction of pain pacifies the medium but disrupts the manifestations. Increasing control intensifies the pain, but improves the manifestations. Loosening of control of necessity introduces unwitting fraud, as it is physiologically easier. The stubborn idea that the medium will achieve a manifestation through fraud may influence the result to be produced fraudulently. In order for a given manifestation to take place, it is necessary that the medium visualizes the phenomenon taking place, thus bringing it closer to the state of monoideism. It is necessary that the medium's feelings and a sense of pride be engaged, and that she should enjoy the session.

In the Warsaw experiments I frequently noticed such periods. As long as Eusapia was amused by the bell, the experiment worked very well; later, it worked increasingly less frequently, and finally she did not even want to look at it. It was the same with automatic writing, which was successful for several days. The desire to light the lamp or to make impressions in clay met with the same fate. These weaknesses must be taken into consideration, and experiments carried out while the medium is ready, as manifestations do not occur on demand.

Another factor that is as important, if not more important, is the routine that was followed in the course of developing the medium. Eusapia always began with the levitation of the table; she would then move to touching (with the astral hand?). Other manifestations occurred only if conditions were

extremely favorable. Aksakov's suggestion, given to me in a private letter, was right. He suggested that no sessions be started with new experiments, but only those that the medium feels at ease with. Other experiments should wait until the manifestations are firm. Every time I wanted to change the sequence, to give a session a scientifically more precise order, the result would be a fiasco. Yet I am convinced that if Eusapia had been trained from childhood to take part in experiments in full light, then light would not present a problem. If simple but correct experiments had been conducted from childhood, there would not be as many suspect and chaotic manifestations, which could bring joy only to practicing spiritualists. By the same token, the concept of spiritualistic manifestations would undoubtedly disappear, because in the manifestations that I elicited from her from the start there was no question of spiritualism.

Both in trance and in the conscious state, manifestations always occur in an ebb-and-flow manner, intermittently, which means that strong, separate, and distinct manifestations do not follow one another, but follow after a pause, as if a breath-catching pause for the medium, which accords with the general laws of neuro–physiological reactions.

When there are various categories of manifestations involved, there is always one category that temporarily more or less excludes the others, meaning that the energy expended in, e.g., acoustic manifestations at a particular moment, cannot simultaneously manifest through light or mechanical phenomena. Intermittently, it can support others but always with the predominance of one category. Because the medium simultaneously exhibits a visible loss of energy, there is nothing in mediumship that would run counter to the general laws of energy conservation and convertibility.

Neither is there anything in it that runs counter to the known laws of mechanics. If a table levitates as if without support, then it is only because the support is not visible, and not because it does not exist. If there is a change in weight, it does not mean that the table itself has changed weight, but only that it is pulled or supported by the invisible hand of the medium's double, or the dynamic current of some thus-far-unknown form of energy (later note: stiff rays).

From this standpoint, it cannot be said that any of the laws discovered by science has been violated. One can speak only of supplementing the old laws with new ones.

Dependence on Participants

If there are no mediumistic phenomena without a medium, then, on the other hand, the presence of a medium alone, in most instances does not suffice to elicit them (I am not speaking here of mediumistic phenomena

in general, for phenomena of a lower kind, such as automatic writing, the unwitting, mechanical movement of a table, and so forth, do not require the presence of participants—but about mediumship proper, that is about the phenomena of a higher kind, which are based on separation of the medium's etheric body).

Eusapia told me that there were never any phenomena when she was alone, and that sometimes, when she wanted to play a mediumistic trick on someone, it did not work. When I was the only participant, there were table levitations, but no touches, lights, or any of the higher kinds of manifestations. When my wife was also present, the phenomena were expanded to include touches, but nothing else.

The proper repertoire of phenomena would occur with three participants, but the most favorable number was from 5 to 6 participants. Beyond that number difficulties would occur, unless all the participants had previously experimented together in the same configuration. The influence of who was present on the success of the session was very evident. Every new person, even the most favorably inclined and least suspect in the medium's eyes, would delay the start of manifestations, or cause the failure of the more difficult experiments.

As far as the attitude of the participants is concerned, undoubtedly a friendly, gentle, and sincere manner aids the manifestations, while a hostile, false, and gruff attitude interferes with them. Eusapia undoubtedly possesses the gift of sensing the character of a person even in the conscious state, and the highest trait that she would single out in those present she would describe as "una persona franca" (a sincere person). Nothing would irritate her more than assurances of approval and satisfaction in which she sensed hypocrisy. Mr. B. Reichman would irritate her enormously when, in answer to her query as to whether he was satisfied with the conditions of the experiment, he would answer "bene, bene," when he thought otherwise. To sincere expressions of suspicion, she would always answer with a new, better manifestation.

Neither can it be said that disbelief that is without ill will interferes with the manifestations. At least three-quarters of the Warsaw participants did not believe in mediumship, yet this did not hinder the manifestations and convinced the majority of them. It is only the dislike, the guarded suspicion, and stubborn conviction of fraud that has a definitely negative influence—I would say that the stronger the suspicions the worse the manifestations.

Unfortunately, this is the vicious circle of mediumship, for which there is no remedy—or rather, only these: patience, impartiality, and sincerity.

If the participants are tired and sleepy, this also has a negative influence. "John" always reminded those who were tired not to fall asleep,

and sometimes he would simply remove them from the circle because they interfered. On the contrary, moderate thought and conversation were welcomed by the medium. Frequent demands to "parlate" (talk) had no other purpose, although I have to admit that in scientific experiments we have a different understanding of the appropriate disposition of the researcher, and would prefer that his attention not be scattered.

Unfortunately, it appears that the simple directing of one's sight directly at the point where a manifestation of the force is to occur makes things more difficult; not totally, for, after all, we had some excellent manifestations when the attention of several pairs of eyes was concentrated on them. However, generally that was the case. For this reason it was necessary to gradually get into the practice of observing without looking directly, yet paying attention to the manifestation while talking about something else.

This is one of those points that associates mediumship with the sleight of hand of a conjurer which, as is well known, depends mainly on skillfully distracting the attention of those watching.

Those who are ill or agitated have a very bad effect on Eusapia. However, if I am not mistaken they benefited from the sessions even if they did not last far into the night.

Finally, we noticed an influence, difficult to grasp, of some nervous states, exhibited by some individuals, which had a paralyzing effect on the experiments, and which could not be overcome even after a longer presence in the circle.

The sessions in general gave me the impression that the medium is merely the mirror that reflects the force, notions, and the mood of the participants, a mirror that converts the force received, concentrates it, and puts it into motion, and that the medium herself does not have sufficient energy to produce the manifestations.

Dependence on the Influence of Atmospheric Conditions

This turned out to be less important than any of the previously mentioned dependencies.

Initially, I would carefully note the atmospheric pressure, temperature, and humidity, etc., but did not notice any clear indications of influence. One can only say that extreme cold or heat is harmful, as are: excess of electricity in the air prior to a storm, too strong a light, a misty day, etc., and finally that a full moon exerts a stronger influence, but not through direct physical action on the manifestations, but indirectly, by a psychic or physiological influence on the medium's nerves. This raises the point of individual differences between mediums, and how they would react to external influences.

I was unable to confirm whether humidity, as stated by "John," had a negative influence on the manifestation of lights, but that is quite likely, especially since in the later experiments on a very humid island off the Mediterranean coast there were few manifestations of light, while in Rome they were plentiful.

Specific Conclusions

The Relationship of Manifestations to Known Physical Forces

Does mediumship reveal to us a new force, in the strict natural scientific meaning of the word, which could take place alongside electricity, temperature, etc.?

Thus far this question has not been looked into in detail, but authors who accept mediumship have let it be understood that this is indeed the case, and have referred to it by different names. The widest acceptance was gained by the expression Psychic Force coined by Cox and Crookes, which has the advantage of not saying much yet pointing to the *psychic* source of the phenomena. By the same token, it appears to exclude any parallel of this new force with the known physical forces. Nevertheless, Crookes's experiments on the weight change of bodies under the influence of Home's hands appear to have had this aim in sight, for Crookes attempted to measure the force that was active in these manifestations, not mentioning that it may be the result of pressure exerted by the medium's fluidic hands.

Starting from the assumption that this may be a force similar to electricity or magnetism, which dissipates with the square of the distance, I attempted to mark its intensity with the aid of appropriate instrumentation, but these attempts turned out to be fruitless, for it was obvious that her activities had no relationship to the medium's body mass. With regard to distance, the manifestations were sometimes closer, then farther away, at times they were stronger at a greater distance than the nearer ones, with the limits shifting under favorable conditions. These limits were always definite, for beyond them there was no weakening of manifestations, but a total cessation. In addition, shielding by inanimate or animate matter was not always a hindrance; but never under conditions where one could simply say: This force, like a magnet, penetrates through all bodies, for it could possibly escape sideways.

Neither did I notice that various metallic or nonmetallic bodies, solids, or liquids behaved differently with respect to the force. Brass, gold, iron, stone, wood, glass, or resin, etc., objects moved through the air with equal ease. Thus far I have found no indications of deflection or reflection of this force. I have also mentioned that there was nothing in this force to

contradict the familiar laws of mechanics. The simple assumption of an unseen (and at times seen) hand, leg, or head, sufficed to explain away to oneself all the mechanical effects, which were astonishing only in that the supports were invisible.

The only manifestations that would indicate participation of some fluidic force were those that I knew of already from experiments with animal magnetism.

In the case of those who were ill or nervously exhausted, whether by the illness itself, temporary exertion, or depressing psychic impressions, I had noted long ago the curious manifestation of a cool breeze from hands, legs, or heads, when holding the palm a certain distance away, a breeze that would cease when health improved. This undoubtedly is a case of taking away heat because the testing hand cools. There is probably something else also involved, some process of equalization of either the electrical potentials, or the pouring over of some waves, which used to be known as the magnetic fluid, to equalize energies. It is enough to say that the same manifestations were more pronounced with Eusapia, especially from her head, where the breeze was long-lasting and strong. At times the breeze was felt by the hands of all the participants, at times from the left, and then from the right side of the medium. Some felt it more strongly than others, some just barely, and some not at all, according to some unknown laws. Occasionally Miss S., who sat at the opposite end of the table, exhibited the same manifestation, just as strongly as Eusapia except only from the hands. At one of the sessions with Eusapia (at Dr. Heryng's, after supper), the breeze seemed to be general, strong, and penetratingly cold.

I tried later to obtain more precise data using a very sensitive thermometer, but no such manifestation occurred.

Once, using a doctor's thermometer, we obtained an increase of one degree Centigrade, but this was done in a different form, as a suggestion by "John" that he take the thermometer in his hand and let us know her temperature. "John" did not relish such unspectacular experiments and it was difficult to induce him to do it. He preferred to knock, make noises, play, and turn over the furniture.

Mr. B. Reichman believed that the breeze could be an electrical manifestation and that if a brass crown with a thorn were placed on the head, we might obtain some flashes of light in the darkness. I warned him that nothing would come of that, and indeed the experiment presented no results. Later he announced that the breeze was simply Eusapia blowing!

I knew that nothing would come of that experiment, for previously, in various ways, I tested the electrical properties of Eusapia's body. There was no effect on the standard electroscope; there was an effect on the

Bonnenberger electroscope (amplified by me), but it was the same as for all others. There was even less electricity in Eusapia's hair than in mine.

There was no effect on a rather insensitive galvanometer when fingers were immersed in water, or when they touched the electrodes directly. This happened regardless of whether the muscles were tensed or relaxed.

When the needle was deflected by the current of the element, which simultaneously passed through the medium's body, there were considerable variations in Eusapia's body resistance, depending on very fast and characteristic changes in the degree of dampness of Eusapia's skin. When I removed this co-factor by immersing her hands in acidified water, there were no changes.

As I have mentioned before, it appears likely that the resistance of Eusapia's body increases during materialization. This would be interesting and in agreement with my hypotheses, but, unfortunately, I had the instrument for the measurement of resistance for too short a time (it was borrowed and taken back by Mr. Reichman) to be able to undertake the appropriate measurements.

Regarding the existing influence of some materials during mediumistic manifestations, the results were mainly negative. Although Eusapia maintained that a silk dress interfered with the manifestations, on a number of occasions she forgot what she had said and the manifestations took place as effectively when she was wearing a black silk dress as when she wore a white woolen or linen dress.

Once, when she sat down to a session in a lambskin vest belonging to my wife, "John" began hitting and pinching her back. Having placed my hand on her back, I determined that Eusapia was not hallucinating, for I was touched myself, and felt movement reflecting the pulling away from a pinch. As it turned out later, "John" was using this approach to tell her to take off the vest.

Maybe there is a connection here with the fact that my dog (a white shaggy poodle) whom Eusapia liked very much was nevertheless never allowed into the sessions, and once, when he accidentally sneaked in, it seemed that he was delaying manifestations. I am adding this speculation only because others have reported similar facts. Maybe it was only due to the distraction that the dog caused, and the removal of the vest could have been simply been motivated by the heat.

What hindered Eusapia during the sessions was her corset. It was not in the sense that it would affect the manifestations, but her aches and pains during the manifestations were greater if she had the corset on. For this reason I always asked her to remove it prior to a session, which in the conscious state she did only with great reluctance.

The action of interrupted induction currents on Eusapia, Miss S., and Mrs. M. was very strong and none of them could stand even moderate shocks. The action of magnets on all three was also visible, but it was not greater than on all the others who are readily hypnotized. All were sensitive to the hypnoscope, which was placed on the finger—Miss S. even to such a degree that her finger instantly became desensitized and rendered useless. Finally, her finger and the entire hand became rigid. In Eusapia's case, the effect was greater on the left side of the body.

However, when I talk of the action of the "magnet," this is only in the sense in which I understand the action of the hypnoscope as something of a mixture of psychic and physical influence, where the magnet does not act in relation to its strength, nor differently in relation to its poles.

Conversely, I saw no specifically magnetic action in the action of Eusapia's hand on a magnet (moving a compass needle from a distance). The needle moved as if pushed by a finger. A brass, tin, and wooden needle behaved in the same way. Eusapia's fingers had no ability to indicate polarity in non-magnetized steel.

Eusapia maintained, doubtless due to someone's suggestion, that at the sessions she should be sitting at the north end, and normally that is how she sat; however, manifestations were the same regardless of the direction she faced.

Why does light paralyze manifestations? There is no doubt that it does paralyze them. To illustrate, I will recount three already known experiments.

1. A table that levitates up to one meter above the floor when a heavy window curtain was drawn would lift only a few inches when the curtain was only partly drawn, and when it was not drawn at all the table would only drag along the floor.

2. The bell rang readily when the lamp was at a distance from the bell, easier still when the lamp was removed farther away, but with considerably greater difficulty when the bell was right under the lamp.

3. When the light was moved farther away, the automatic writing became darker and clearer, and when the light was brought closer the marks became lighter and weaker.

I could cite many more examples, for all manifestations were subject to the same law: The less light is available, the faster the manifestations come, and they are stronger and clearer.

When the light was bright I saw only movements of the bell, the automatic writing, levitations, and movements of some pieces of furniture.

When the light was weak, I saw a materialized hand and its touches, and various mechanical effects.

The highest level of manifestations, such as complete materialization,

voices, lights, complete levitations of the medium, etc., occur only in total darkness or near total darkness.

It is very likely that such difficulties are not impossible to overcome, for Crookes saw a complete materialization in good light, and in our experiments some manifestations occurred initially only in darkness, but later they would occur in satisfactory light. If I am not mistaken, this is a matter of having a greater number of sessions with the same participants.

Because light interferes with manifestations, the question arises as to why. Two explanations could be put forward:

a. purely physical. Light is capable of putting Crookes's radiometer into motion, changing the electrical conductivity of selenium, causing a chemical reaction between chlorine and hydrogen, etc. . . . It also acts upon the medium's etheric body, scattering the atoms that gather around its force lines, and opposes the very separation of the etheric from the material body.

b. purely physiological. Light, in irritating the medium's nerves, hinders the appearance of partial or complete trance, which is a condition for the separation of the etheric from the material body. However, it might operate finally, and it does so through the medium, and not directly upon the manifestations.

(If the end colors of the solar spectrum acted differently, as has been assumed to date, one could, on the basis of the difference in their vibrations, draw conclusions supporting the first hypothesis. But as we know, these differences are subjective, and because of other observational considerations I am inclined toward the second hypothesis.)

Light acted very strongly upon the medium immersed in a trance, but its force depended not so much on the brightness of the light, but rather on the degree of preparation of the medium. If the sudden lighting up of a match resulted in a convulsive shock and longer-lasting indisposition, then the lighting of a strong magnesium light, with her prior knowledge, not only did not have such consequences, but it did not in the least interrupt some of the manifestations, namely, the levitation of a table. To be sure, as I have already mentioned, the table would always turn in such a manner so as to at least shield part of one leg (the left one). (It could thus be the case that the second hypothesis, that of physical action directly on the points of attachments of the mediumistic force, has justification—naturally, if such shielding does not have either conscious or unconscious fraud as its aim.)

The point that merits attention is that light appeared to act not only upon the eyes, but also upon the medium's entire body. When, during a trance, while blindfolded, a spot of weak light was directed at her hands, the hands would withdraw and evade it, displaying irritation. It seems that the most irritable were the eyelids and the head, more than the rest of the body, with

the possible exception of the hands. In any case, when lights were turned on immediately after a session, prior blindfolding did suffice, and she always felt a nervous shock from the turning on of the light (even without noise), for example by pushing a switch of an electric lamp. To treat her gently one had to turn the light on in the adjacent room, and open the door gradually so that she would not be hit by direct light. Flickering light irritated her most.

The following circumstance confirms the paralyzing effect of light: If the manifestations were too strong and they tired Eusapia, she would request that a door to a brightly lit room be opened slightly. Apparently she herself was unable to stop the manifestations by her own will, while the light would perform that function immediately. Sometimes, in exceptional cases, when manifestations were developing very slowly, in order not to tire the medium, the session would be cut short when they were taking place, but the mediumistic restlessness would continue and even when she was lying in bed there would be no peace. Entering with a light would not stop the phenomena either. There would no longer be the heavy pounding on the table, nor the general shifting of the furniture, but the knocking around her bed would continue. In most instances she would ask that the lit candle be left in the room, where it burned until morning.

I have confirmed many times that, when in a trance, Eusapia can see in total darkness. It is an absolutely essential condition for performing her manifestations, which always demonstrate extreme care in avoiding all obstacles, despite the absence of light. No one was seriously hit despite the fact that tables, chairs, pots with clay, boxes with electrical batteries, etc., traveled overhead. Prus broke his finger once in an attempt, by extending his hand, to check whether the chair standing on the table with the seated Eusapia did indeed levitate. "John" made a few passes along the finger, reducing the pain dramatically. Also once the medium herself hit her head against a board which hung from the ceiling (it was used in measuring the height of mediumistic effects) when, during a levitation of the seated medium from the floor to the top of the table, some participants broke the "chain." I cannot, however, say for certain whether she hit the board after the "chain" was broken or a moment before, in the course of floating to the tabletop. It seems to me that it was before, which in this case would indicate that she did not see the boards. In other cases the opposite appeared to be true: that she would see the obstacle not only directly, but also through the table, for she felt it sometimes when someone would slightly change their position. In such cases one could truly state that she was controlling us better than we controlled her. Normally she also felt it when someone, in the dark, broke the "chain." When years earlier I experimented with Slade, I did not observe the ability to see under the table, for when I changed the

location of my hand slightly, the "apport" sought it in the former place.

I have confirmed that in the conscious state she does not have this ability. Her sight might even have been worse than mine. Once a key fell out of her pocket in a dark corner of the room, a key she needed at that point in time. I saw it, but let her search for it. She sought it for quite a while by feeling for it, while it was visible to me.

As for seeing without the aid of eyes while in a "magnetic" trance, the experiments are very interesting but thus far not sufficiently numerous.

Finally, the most plausible conclusion for me is: In a trance, Eusapia attains an unusual visual supersensitivity, which appears to be accompanied by the entire body's abnormal sensitivity to light. This then explains to a large extent the detrimental effect of light, for if Eusapia sees in the dark, while in trance, this then means that very weak impulses, such as lighting a match at a great distance, would be the same as suddenly lighting up an arc lamp for those with normal sight. What is more, in addition to the shock to the eyes, she suffers from a general pain, resulting from sensitivity of the skin.

On the other hand, darkness seems to be a condition for total trance and thus it was a rare occasion that I could see her face to observe the changes that the trance evokes. Just once or twice, in a complete trance, the light was sufficient to observe the expression of her face and eyes. In those cases, the expression was that of ecstasy, somewhat different from the usual look.

In other words, I assume that light has a paralyzing effect on the manifestations, because it irritates and excites the medium. A partial trance is not apprehensive of light, but then the points of attachment of the force are in relative shade.

It had already been noted long ago that music and song, choral music in particular, favor manifestations, perhaps because they generate a mental communion within the circle, maybe because they generate the alertness which was demanded by "John." Then again, sometimes it helps to draw attention away from the mechanical aid to the phenomena. "John" usually demanded that we talk, but not as a heated discussion, rather a peaceful, half-loud conversation, or reciting something. This did not hinder observation—at most it could hide a suspicious sound. At the same time it was apparent that this activity of ours was helpful to "him," even when there was no question of a suspicious noise. As it reminded her of home, the song *Santa Lucia* had an excellent effect on her disposition and on the manifestations, until she got tired of hearing it. Variations on Italian tunes, played on the piano by Siemiradzki, had a similar effect. Eusapia, however, demanded musical help only at the beginning of a session, when manifestations were slow in coming, or during the more important manifestations, such as the

levitation of the medium or impressions in clay. We were generally quiet, or spoke about matters to do with the control of the medium in a calm manner, as any sudden noise, rap, or tone had the same paralyzing effect as the light. Most probably this happened because the medium was awakened from trance or at least her attention was distracted.

At times "John" himself felt a musical urge and would play for us on the piano (with one finger), mouth organ, trumpet, or accordion. The latter was used only in Warsaw. The trumpet was a simple, toy-like one, but it required almost complete materialization.

Of great interest to me were the manifestations of mediumistic echolalia consisting of precise, although weaker, repetitions by "John" of our knocking, scratching, shuffling, or drumming. Initially I assumed a rather complex theory for their occurrence. Following the Warsaw experiments I believe that they depended on partial materialization of the fluidic hand. There was always a certain delay (2–3 seconds) in the repetition; sometimes the delay was considerable (5–10 seconds), as if "John" needed first to solidify the hand, before he could create a sound. There were no imitations of musical tones.

During the echolalia experiments, Eusapia would request that whoever created a particular sound should place their hand flat on the table, at the spot where the sound was made, as if to hold on to the created sound—I do not why she asked for that, and she did not know either. I assume that this action was of little significance, as echoes occurred without it.

Manifestations of echolalia belonged to the earliest ones at a session, and sometimes I would rap to a certain rhythm a particular number and wait to see whether "John" would repeat the sound. I used it to find out whether "John" was there. This procedure was also followed by Eusapia, who found it easy to elicit the echoes. Quite frequently, however, she herself did not sense whether manifestations had already happened and she would keep knocking in vain.

"John's" voice, if he did not speak through Eusapia's lips, was always grating and unclear, and following such an experiment she would lose her voice for a while. I do not know whether this happened through sympathy or actual participation. This also happened to Miss S.

When a group of participants developed greater harmony, talking and maintaining the "chain" became for the most part unnecessary.

Relationship between Mediumship and Hypnotism

As I have frequently emphasized, the relationship between mediumship and hypnotism is a very close one—yet when I began to investigate mediumshp, this relationship had not been formulated.

Mediums were considered as something apart from those under hypnosis. Now I believe that this was one of the main reasons for the slow progress in the scientific study of spiritualism, which in this way lost all contact with the existing disciplines in normal physiology. Now it is obvious to me that mediumship represents only a new category and a higher degree of hypnotic manifestations, and there can be no study of mediumship without a thorough knowledge of hypnotism; otherwise it will continue to be elusive and seemingly in conflict with everything that science acknowledges. Since among scientists too few study hypnotism on a larger number of individuals, it is hardly surprising that there are so few prepared to evaluate mediumship properly and that the most eminent among them recognize only two alternatives: fraud or miracle.

Eusapia was hypnotized for the first time in Warsaw, and it was in Warsaw that attention was drawn for the first time to the need to study the mediums themselves, as a separate category of persons under hypnosis.

Thus far, mediums have been recognized as a second-grade tool for manifestation of supernatural states. It was not until after the Warsaw experiments that mediumship and spiritism were differentiated, although Aksakov differentiated between spiritism and animism, which for him was equivalent to mediumship.

However, for Aksakov, "animism" included only the less important manifestations, which could find their expression in the "anima" of the medium; however, the name "mediumship" came to be applied to all (low and high) manifestations, emphasizing the dependence of all mediumistic phenomena on the medium. The terms "mediumship" and "mediumistic" have also been accepted in foreign literature, especially German, to mark the scientific character of these studies, without prejudging Allan Kardec's doctrine.

As stated at the end of the Introduction, I am reporting the Warsaw experiments here for the first time, but this report is based on my other articles, mainly the general report of the participants, published in *Kurier Warszawski*. A version of this in French was ably edited and abbreviated by Mr. Kazimierz Krauze, and published in *Revue de l'Hypnotisme*. It is worth noting that Krauze's report was the first article on mediumship to be accepted by the editors of *Revue de l'Hypnotisme*, whose attitude to mediumship so far has been hostile, as they did not expect it to be associated with hypnotism.

Only the Milan experiments had higher ratings prior to the Warsaw experiments, and this was due to the fact that a number of people well-known in science were in attendance. However, both series of experiments are merely drops of water on the rock of general indifference.

Notes

[1] Bolesław Prus (1847–1912), pen name of Aleksander Głowacki, journalist and novelist. His works are now classics of Polish literature, and he has an extensive Wikipedia entry also in English. A close friend of Ochorowicz from their student days, Prus based an attractive character on him in his novel *The Doll*: "Julian Ochocki is an idealistic and passionate enthusiast of science, inventor and researcher, misunderstood by society but not at all bothered by this, being only interested in his work."

[2] Julian Adolf Święcicki (1850–1932), poet, playwright, literary critic, translator, and editor.

[3] Marian Gawalewicz (1852–1910), playwright, novelist, essayist.

[4] Bronisław Reichman (1848–1936), naturalist, journalist, editor of a popular science weekly, keen Darwinist, and school colleague of Ochorowicz.

[5] In an article published in the periodical *Kraj* in January 1894, Prus expressed his opinion of the sittings:

> With so many various precautions, so much examination and self-examination, and with more than a dozen very successful sittings, I came to the conclusion that the mediumistic phenomena caused by Eusapia are not due to sensory illusions, nor suggestions, nor hypnotism. All the movements of objects, all the sounds, sounds of instruments, lights, etc.—all of these were real. And we, the witnesses, were normal observers and not victims of madness, possession, or hallucinations.

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ESSAY

Bob Jahn, Co-Founder of SSE

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Thank you for the tributes to Bob Jahn published in the Spring issue of the *Journal*.

As I describe in *A Tale of Two Sciences* (Exoscience 2009:81–95), my meeting with Bob in March 1978, when he was spending a sabbatical leave at Stanford University, was the beginning of many discussions that led to the creation of the Society for Scientific Exploration (SSE) in 1982.

Bob was a remarkable individual and a tremendous asset to SSE. He was a wise councilor and an efficient and effective officer, who was a mainstay of the Society over the last three decades of our history. Bob did more than anyone to help SSE grow into the sound, effective, and productive organization it is today.

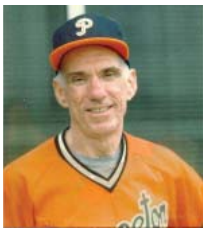
Bob also exemplified what is best in science. He was open-minded, he paid attention to the evidence, and he thought long and hard about theoretical implications and interpretations.

Are not all scientists open-minded? Regrettably, the answer is no. Scientists are also human beings, and the human tendency is to believe what one wants to believe. When faced with a new idea, most scientists will look for—and manage to find—a reason to discount it. Bob was not like that. He would refrain from giving an off-the-cuff response, he would ask a few probing questions, and then he would go away and think about it.

When faced with the challenge of understanding the branch of parapsychology that deals with mind–matter interaction, he wisely decided to first acquire the best set of data that he could. This led to a sequence of very carefully planned experiments that extended over decades, and which now comprise one of the most reliable and informative datasets in the field.

After many years of innovative experimental work, Bob was ready to start thinking about its theoretical interpretation. These thoughts evolved over time, leading eventually to the sophisticated concepts embodied in his M^5 model (for Modular Model of Mind–Matter Manifestations).

To properly appreciate Bob's achievement, one needs to compare this response to the challenge of mind–matter interaction with that of most scientists—which is to look for some excuse not to face up to the problem.



A typical response would be "Well if A were true, that would imply B, but of course B is incompatible with C which is well-established, so I am sorry that I cannot take your ideas about A too seriously." All sounding very reasonable on the surface, but typically invalid when examined carefully and objectively.

Bob was a true scientist, seeking the best evidence of any topic he investigated—generating much of that evidence in the PEAR Laboratory in collaboration with Brenda Dunne and other luminaries of that enterprise—and then proceeding to explore the theoretical implications of that evidence.

Peter A. Sturrock
Co-Founder, Society for Scientific Exploration

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BOOK REVIEW

Dear Martin / Dear Marcello: Gardner and Truzzi on Skepticism
edited by Dana Richards. Singapore: World Scientific Publishing, 2017. 458 pp. $54.20 (paperback). ISBN 978-9813203709.

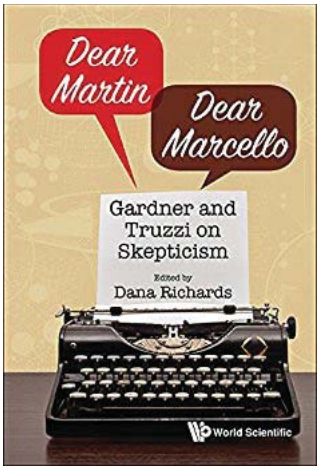
DOI: https://doi.org/10.31275/2018.1283

This is a collection of correspondence between Martin Gardner (1914–2010) and Marcello Truzzi (1935–2003). The editor, Dana Richards, never introduces himself, but he is associate professor of Computer Science at George Mason University and was a longtime friend of Gardner as well as his bibliographer. Kendrick Frazier, Editor of the *Skeptical Inquirer* and Michael Shermer, Publisher of *Skeptic* magazine, have contributed blurbs, showing their appreciation of the book.

Richards has written an Introduction in which he provides brief backgrounds of Gardner and Truzzi. Gardner developed an early, lifelong, interest in magic. In the 1930s he was educated in the philosophy of science. In the 1950s he started to develop into the godfather of the modern skeptical movement. His book *In the Name of Science* (Gardner 1952), a collection of essays about what he considered to be irrationalism, became popular in the late 1950s and was reprinted (Gardner 1957). At that time Gardner also became well-known for his column "Mathematical Games" which ran in *Scientific American* from 1956 to 1986.

Truzzi was born into a circus family, hence his interest in magic and his many articles about circuses. In the late 1960s Truzzi became interested in the occult revival, and got a Ph.D. in sociology. He edited and published *Subterranean Sociology Newsletter*, later *Explorations*, later *The Zetetic*, and eventually *Zetetic Scholar*. In 1982 Truzzi was one of the founding members of the Society for Scientific Exploration (SSE).

The correspondence between Gardner and Truzzi starts in 1970. At the time, Truzzi was 34 years old and Gardner was 55 years old. Combined with Richards' Introduction, the correspondence provides some details about the origin story of the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP). Much correspondence concerns Immanuel Velikovsky and Michel Gauquelin and how they should be treated. Gardner regarded both men as cranks, and defined the typical crank as ". . . a man who passionately believes in his system, but for one or more



reasons is blind to the evidence against it" (p. 66). However, Gardner did not regard J. B. Rhine, Charles Tart, Robert McConnell, or Gardner Murphy as cranks. To Truzzi crank ". . . mainly means someone stubborn and obstinate, someone eccentric possibly, but not necessarily irrational about it" (p. 91). Gardner was inclined to ridicule cranks and Truzzi was more inclined to treat them with respect.

Gauquelin became known for finding the so-called "Mars effect" which has been debated in the pages of the *Journal of Scientific Exploration* previously. To Gardner, the very idea that the position of planets could have an influence on people was ". . . too outrageous to justify trying to test it" (p. 114). However, members of CSICOP became involved in replication attempts and the end result was: negative publicity (Rawlins 1981), the resignation of some members, a policy to not conduct research, and eventually a denial of a cover-up! The correspondence naturally touches on this. Several members of CSICOP have tried to dissociate CSICOP from the matter, but as Truzzi (1982) noted their efforts are not convincing.

It may come as a surprise to some that Truzzi was originally more skeptical than open-minded concerning psi. In 1979 he wrote "I am inclined to disbelieve in psi, but I must confess the issue remains quite open; and here I am truly more agnostic than I was a few years ago . . . " (p. 220). Gardner did not believe in psi, but as Truzzi once pointed out Gardner had to reject the common definition of paranormal to avoid having to label himself a paranormalist. Gardner believed in God, the power of prayer, and life after death (Hansen 2001). He also admired the philosopher C. S. Peirce, and possibly more surprising William James. Gardner wrote:

> My attitude is exactly the same as that of William James, the American philosopher I most admire and whose photograph hangs in my library. I think that James was gullible on many occasions, owing to his lack of knowledge of methods of deception, and his almost total ignorance of mathematics got him into occasional trouble, but he was a Platonist (as am I) in the sense of having a marvelous sense of wonder at the infinite mystery of being, and open to all possibilities. (p. 170)

As all who are familiar with their writings know, Gardner and Truzzi agreed on precious little. Both were nevertheless among the founders of

CSICOP in 1976. However, due to differences of opinion, Truzzi resigned in 1977. Apparently, there had also been a personality clash between Truzzi and Paul Kurtz, the Chairman of CSICOP, from the start. Truzzi made his views clear (see Clark & Melton 1979a,b; Truzzi 1980), but the absence of his letters to the CSICOP Fellows in the book is unfortunate.

Among other things, Gardner and Truzzi disagreed about CSICOP's journal (first titled *The Zetetic*, later *Skeptical Inquirer*). Gardner wanted ". . . a nonscholarly, nonacademic, bad-tempered magazine . . . perpetually skirting libel laws" (p. 61). Gardner considered it as being a means to combat the occult wave rather than being devoted to analyses of the occult revival. In contrast, Truzzi wanted it to be a scholarly journal and after his resignation from CSICOP he published and edited *Zetetic Scholar* (ZS). In several letters Gardner complains about the *ZS*, and Truzzi wrote back:

> It seems to me that you are accusing me of being revengeful and fighting a personal vendetta in *ZS* when I am clearly trying to be fair-minded and responsible toward both sides. I don't claim I always succeed in being completely fair. But I assure you that I get more complaints about my not being harsher on Kurtz & Co. from readers than I get the other way around. In fact, so far you are the only person to suggest that I have been using *ZS* for revenge or a vendetta. (p. 367)

Truzzi wanted to act as a kind of amicus curiae ". . . a friend of the court who recognizes the rules of evidence and the adjudication procedure and tries to help the process work more efficiently and fairly" (p. 78). Gardner felt that some claims were so extreme that horselaughs rather than argumentation was warranted. Despite their differences, they had mutual respect for each others' views. Gardner wrote:

> The worst I have said about you are: You are naive with respect to the philosophy of science, relatively uninformed about the physical sciences, overly fond of bizarre, Fortean-type anomalies, uninterested in the kind of eccentric science that has the best chance of providing a new Kuhnian paradigm, and fond of sitting on the fence with respect to outlandish claims. (p. 382)

After more than ten years of correspondence, their relationship turned sour in 1981 when Truzzi tried to find out why and how Dennis Rawlins was ejected from CSICOP. Gardner thought that Truzzi had a vendetta against Kurtz and CSICOP; hence he eventually declined to answer. The correspondence between Gardner and Truzzi ceased for a while and when they started to correspond again their letters were less frequent.

Gardner considered some of the correspondence to be worth publishing. Truzzi was more hesitant because the readers would not understand the

context. In order to appreciate reading the correspondence one needs to have some familiarity with philosophy of science and the history of parapsychology. Readers should note that some of the correspondence concerns articles that were reprinted in *Science: Good, Bad and Bogu*s (Gardner 1981). Some correspondence naturally concerns Uri Geller. Gardner considered him to be a magician who ". . . more or less improvised his own methods, without much knowledge of modern mentalism" (p. 25). Other individuals whom the correspondence touches upon are Jule Eisenbud, J. Allen Hynek, Harold Puthoff, and Ted Serios. Much correspondence as noted above, does, however, concern Immanuel Velikovsky and Michel Gauquelin.

The book includes a name index, which should have been useful, but a cursory look reveals that it is misleading. For example, Velikovsky is mentioned in numerous letters, yet the index directs the reader to just three pages; hence the index is almost useless. Unfortunately, much of the correspondence is also quite tedious and repetitive. In addition, many letters are missing. The editing of the correspondence has been minimal, though addresses and phone numbers have been omitted. The book would really have benefited from some explanatory footnotes and the inclusion of references because many readers lack a grasp of context. In summary, the correspondence is mainly of interest to curious readers who have some familiarity with Gardner's and Truzzi's writings.

—Nemo C. Mörck
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BOOK REVIEW

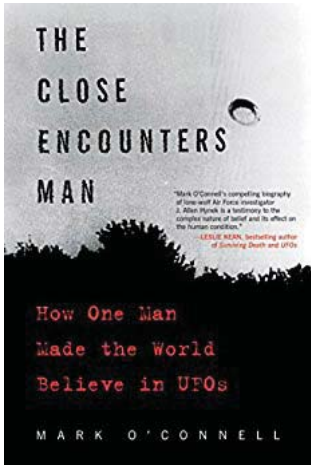
The Close Encounters Man: How One Man Made the World Believe in UFOs by Mark O'Connell. 403 pp., New York: HarperCollins, 2017. 403 pp. ISBN: 0062484176.

DOI: https://doi.org/10.31275/2018.1280

Though short in physical stature, Dr. J. Allen Hynek is the towering figure in the study of unidentified flying objects (UFOs), an enterprise that has attracted an astounding amount of public interest and in part responsive attendant effort and investigation by governments worldwide over the last 70 years. Yet the lack of recognition accorded Hynek beyond that of his name and a few associated phrases is merely one of the many contradictions in the life and work of the man. From 1948 to 1970 he was the U.S. Air Force's (USAF) top consultant to its public Unidentified Flying Object (UFO) program, studied thousands of its cases, and figured in many of its controversies. Hynek's *The UFO Experience* is arguably the best book written on the subject (Clark 2017), and he left an enduring legacy by founding the Center for UFO Studies in 1973, its publications setting a high standard for work on the subject and fostering a number of disciples and other researchers. Hynek's matrix for evaluating UFO reports by "strangeness" and witness credibility allowed a determination of the probative value of those reports; his basic six-category system of reported UFO phenomena has dominated the discussion since its first publication in 1972; and the "Close Encounters" subset of that system has, along with Hynek's rather unfortunate "swamp gas" statement, for better or worse become part of the popular lexicon.

Those interested in UFOs will remember Hynek mostly as the consultant to Project Blue Book who turned his back on the USAF attempts to whitewash the subject, coming to advocate serious study of unidentified flying objects. A smaller group of academics and technical people know of the scientist Hynek, highly regarded both for tangible accomplishments in astronomy, but also as champion of interpersonal techniques and changed attitudes as to how the astronomical community conducted its efforts. Numerous university graduates will remember Hynek the teacher and administrator.

A book has long been needed about Hynek's life and times, setting in context and reconciling the ufological, astronomical, and academic careers,



and attempting to explain contradictions that surface during that life's story. In *The Close Encounters Man: How One Man Made the World Believe in UFOs*, screenwriter, university teacher, and UFO researcher Mark O'Connell seeks to unite the different "Hyneks" and show how J. Allen Hynek's formal, "mainstream" careers and UFO entanglement benefited each other, and in fact helped form a significant part of today's popular culture. And interviews with certain Hynek family members and former colleagues provided O'Connell with additional clues toward assessing Hynek the man.

Hynek demonstrated an openness to new data, collected and examined as rigorously as possible, that should characterize scientific thought and procedure. The problems posed by UFOs were many, however, and puzzled Hynek to his death. Hynek may never have settled upon exactly what he believed UFOs—or some of them—to be. Biographer O'Connell quotes Center for UFO Studies archivist–historian Frank Reid as saying Hynek "vacillated, sometimes day by day or hour by hour"—yet also that "Hynek's vacillation on the subject was proof of his scientific integrity" (p. 346). And Hynek never advocated what became the traditional "nuts-and-bolts" UFO explanation with the consistent passion popularly ascribed to him. Late in the 1960s—likely in 1967 at Hillsdale College almost a year to the day after its famous sighting—Hynek gave a lecture in Michigan. Backstage afterwards, Hynek entertained a little knot of adoring fans and chatted about UFOs. Dealing with why certain UFOs weren't reported continuously along a certain route, he proposed that perhaps they flit in and out of our existence. Was this an early interest in mysticism and Rudolf Steiner's alternate world idea manifesting again? Or was it just Hynek's creative scientific mind considering different hypotheses for the observed data? In either case, Hynek demonstrates a broad-mindedness quite different from Donald Keyhoe's firm ET belief that has been so dominant in the field since the early 1950s and was adopted by Dr. James McDonald as the "least unacceptable" of eight different hypotheses for UFOs that he could imagine. Many modern ufologists who find ET vehicles an unsatisfying explanation for some or all "genuine" UFOs could recognize Hynek as a forerunner. His thought certainly does resonate with some of these researchers when Hynek suggests that UFOs were to some "a new form of religion" with a scientific twist (p. 328).

So what is the importance of Dr. J. Allen Hynek? To scientists and other like-minded engineers and other individuals aware only of Hynek's UFO career, perhaps the takeaway is nothing more than an example of single-minded determination against the status quo. But there are numerous tangible contributions, as well, to hard science and technology. Besides the proximity fuze work in World War II, Hynek was instrumental in a high-altitude camera project; proposal for a telescope and weather satellite, which would find eventual realization in TIROS I and the Hubble Space Telescope; selection of Apollo space program lunar landing sites; finding a record number of supernovae in a short amount of time; and the image orthicon, using a television tube to enhance the brightness of astronomical images (which Hynek thought was his greatest astronomical achievement). Hynek, along with Fred Whipple, also implemented a global satellite tracking network, Project Moonwatch, intended for U.S. probes. When the Soviets surprised the world with their first Sputniks, Hynek and Whipple turned the Moonwatchers and equipment over to the task of following these Communist space objects, and explained to the American people just what was going on. Hynek's contributions to the way science and technology were executed include coordination of international observations of the June 1954 solar eclipse and the July 1, 1957, to December 31, 1958, International Geophysical Year efforts, promotion of high-energy and fast-deadline peaceful activities that drove fast obsolescence of equipment, and concomitant changes in how scientists viewed their equipment, and even crowdsourcing. And Hynek broke attitudinal ground with his physical science colleagues in his salutary championing of respect and sympathy for witnesses.

Hynek tried to bridge the gap between UFO studies and mainstream science in several evident ways. Hynek's system of Close Encounters and three categories of UFOs-at-a-Distance (Daylight Disks, Nocturnal Lights, and Radar/Visual) cases (Hynek 1972:28–31), and his "S-P" matrix system that gauged the value of a UFO report in terms of its deviance from expected reality and also the coherence and believability of the witnesses (Hynek 1972:22–28, with chart on p. 27), provided needed classification schemes to enable scientists and other researchers to communicate effectively. Hynek strongly advocated the serious study of UFOs in his books and articles in letters to and interviews with various publications, running the gamut from *Science* to *Playboy*. His speaking engagements and other public appearances promoted his message all across the country and abroad. And his 1972 book *The UFO Experience* is still regarded as perhaps the best UFO book ever written, garnering surprisingly good reviews in the larger literate community, largely because of the academic approach with which it

was written and the recognition Hynek's astronomical and teaching career had won him.

Dr. Hynek's organizational legacy has been the J. Allen Hynek Center for UFO Studies (CUFOS). CUFOS has fostered investigations, publications, and in general the work of numerous researchers. Reading the list of contributors to its late periodical *The International UFO Reporter (IUR)* reads like a *Who's Who* of the serious ufologists of the last 40 years. Indeed, sitting some 15 years ago in the Library Room of the Center's former brick-and-mortar location in Chicago, Illinois, this writer was strongly taken by how many of the books on the packed shelves owed their creation to people affiliated in some way with Hynek and/or the Center.

How much of an influence Hynek had on popular ufology is more difficult to gauge. A May 2016 survey was performed on a Midwestern UFO group composed predominately of middle-aged or older adults with more than a decade of interest in UFOs and a strong belief in their importance, with almost 40% of the respondents claiming to have read more than 20 books on the subject. The results demonstrated good name recognition of Dr. Hynek as a leading UFO scientist and his connections both to "swamp gas" and Project Blue Book. But while close encounters type IIIs (CEIIIs) were commonly understood, only a small percentage of the respondents could list all three types of Hynek's "UFOs-at-a-distance," about the same number as those who could identify the "Probability" half of the "S–P" ("Strangeness-Probability") matrix for estimating report significance.

Against this somewhat indifferent backdrop, biographer O'Connell says *The Close Encounters Man* is an attempt "to rectify Hynek's story, to find the heroism, humor, and humanity" in the man. Generally speaking, this is a fine biography and first effort at explaining the "Close Encounters Man" to a variety of audiences, including the public. The "art" in this book is especially deserving of emphasis, for the simple fact is that it is a book that a wide audience should find worthwhile, and indeed fun, to read. The book is well-written, with a clear and easily-flowing style. Perhaps it is not the "definitive work," but it is generally well-researched, eminently readable, and therefore a highly commendable and indispensable resource for understanding the man and his contributions.

The Close Encounters Man amply demonstrates how Hynek turned from UFO opponent to "proponent." His was not a "Road to Damascus" (Franch 2013) overnight conversion, but an evolutionary process based upon logic if perhaps also something of the mystical tinge that O'Connell and book reviewer David Halperin[1] accentuate. O'Connell portrays Hynek as a scoffer at the outset, the apparently dead-rational scientist who was an ideal "go-to" guy for astronomical explanations of UFO reports. But, as

O'Connell shows, perhaps as early as 1952 and certainly by 1953, Hynek recognized that UFOs proper were something more than misidentifications, hoaxes, and the like. O'Connell believes that in 1952 Hynek was struck by the fact that good UFO reports "endured"—they persisted, against his initial belief that they were a "silly season" product and that the public "whim" would pass. Even more, a quiet poll of astronomers Hynek conducted that same year surprised him at how open most were to the study of these strange new off-world fantasies. In fact, some of the 44 scientists Hynek canvassed revealed that they had actually *seen* a UFO. But there was a vast gulf between willingness to research or much less to confess privately to having seen a flying saucer on the one hand, and admitting it publicly, on the other—that was professional suicide (p. 77).

The April 24, 1964, Socorro, New Mexico CEII–III story of Officer Lonnie Zamora had had a major impact upon Hynek, and Hynek felt courageous enough in 1965 to endorse the groundbreaking work *Anatomy of a Phenomenon*, a book by his protégé Jacques Vallee, on its rear cover. In 1966 Hynek went further, penning the Foreword to *Challenge to Science: The UFO Enigma*, co-written by Jacques and his wife Janine. Nonetheless, Hynek felt close to professional suicide in 1966, as frictions between himself and his then-current Air Force boss, Hector Quintanilla, reached a boiling point. The events of March 1966 may have catalyzed Hynek's reticence to mount a public campaign for UFO honesty into action.

A major UFO "flap" occurred in southeast Michigan from March 14th to the 22nd, involved numerous local police jurisdictions and hundreds of citizens, and was highlighted by the classic Dexter and Hillsdale sightings. On March 20th the Frank Mannor family's "Disney night" was shattered by a "meteor" that seemed to settle into a swamp on their property—then bob up and down again. Dexter police and Washtenaw County Sheriffs' units, already "on alert" due to distant encounters they as well as others had had within the last week, were dispatched to the scene. Several hours later, dozens of civilians were confused by what had happened at the Mannor property, while peace officer units from several jurisdictions chased more UFOs through the southeast Michigan countryside.

The next evening, coeds at Hillsdale College, some 60 miles southwest of the Dexter "hullaballusion," were either trying to get some sleep and/or preparing for their exams. This was made difficult against the backdrop of a major storm that was also dampening the ardor of the hundreds of University of Michigan and Eastern Michigan University students, faculty, and common citizens whose UFO vigil in the hopes of a second night of UFOs there was making the life of the Mannors miserable in Dexter. At about 10:30 p.m. one Hillsdale coed saw something appear to zip by her

women's dorm window and set down into an arboretum below. She and more than a dozen other excited women agreed to make a call to the local Civil Defense chief, William "Bud" Van Horn, who told his wife to tell them to call him again should the thing reappear.

An hour later, the now-energized coeds *did* see the apparent object again, moving up and down in the arboretum, and phoned the Van Horn residence once more. This time Van Horn responded in person. When Van Horn and the Assistant Dean for Women got to the room whose overlook of the arboretum afforded the best view, they and a much larger group of exam-haunted young women stared at the thing. Eighty-seven people watched the apparent object move around in the arboretum during a four-hour–plus period. Van Horn saw the thing through binoculars and came to believe it was a solid object—though he had originally thought it was the product of "marsh lights" self-igniting for some reason in the late-winter and electrified atmosphere (p. 186).

What makes the Dexter and Hillsdale events—which never qualified as "close encounters" nor left identifiable trace evidence—noteworthy is what happened next. After initially refusing to send Hynek to Michigan to study the situation, Project Blue Book head Hector Quintanilla dispatched his top expert to deal with this rapidly-expanding UFO media "problem." The result was a whirlwind investigation truncated by a hastily scheduled press conference that, Hynek was commanded, would feature an explanation for the Michigan reports that would damp down the expanding public sensation. By a process covered in a presentation biographer O'Connell gave in Ann Arbor, Michigan, on March 19, 2016, Hynek arrived at the "swamp gas" suggestion for the two Dexter and Hillsdale sightings. The result was largely a public outcry whose repercussions traveled worldwide. Local officials and House Minority Leader Gerald R. Ford, whose district was in the west of Michigan, called for a Congressional investigation of the Air Force's treatment of the concerns of the witnesses and others, and of Project Blue Book itself. Hynek, plagued by the events and a jaw he'd broken the previous week, and unhappy with the reception he figured he'd get from his "invisible college" UFO-minded associates back in Evanston,[2] headed back to Illinois, convinced that this was the lowest point in his Blue Book career.

Not much later, on April 5, 1966, Hynek would testify, with some courage, as he put it, at a one-day public hearing before the U.S. House Armed Services Committee. Hynek urged that an independent investigation should be conducted of Project Blue Book—and indirectly of his role as UFO-debunker within it. That very day, partly driven by a similar recommendation recently made by a secretly convened group, Assistant

Secretary for Defense Harold Brown set things in motion for a study similar to Hynek's proposal. This would result in The University of Colorado UFO Project, the end of Project Blue Book with the for-some-years–desired ridding of UFOs from public Air Force responsibility, Hynek's surprising ascendancy to his highest popularity ever, and his founding his own UFO study organization, CUFOS. Though Hynek would say that he had not fully made up his mind about UFOs until later in 1966, it seems clear that the "swamp gas" flap had set him irrevocably on his course.

There is less in the O'Connell book about J. Allen Hynek's life before UFOs, especially dealing with the period before Hynek's graduation from the University of Chicago in 1932, than one might expect in a biography. Yet here, as throughout the book, O'Connell is careful to uncover elements—experiences and interests—that would inform the rest of Hynek's life. The small mystery as to how Josef Allen Hynek became "J. Allen," for instance, is naturally solved early on. Hynek may have been stimulated to navigate carefully the shoals of academic and generally professional life, in the lesson he learned about publishing a doctoral dissertation that proved the inaccuracy of a cadre of astronomers; that the "more convincing" rather than the "right" argument should prevail (p. 24). Hynek would apply this learning to his often-prickly relationship with the several heads of Project Blue Book, an association that O'Connell compares to that between Johannes Kepler, one of Hynek's idols, and Tycho Brahe. Hynek's background would affect his largely contentious back-and-forth with the young Carl Sagan, whom author O'Connell paints in less than favorable strokes (for example, pp. 303, 305). Throughout the biography Hynek is shown promoting the multiplicative value of teamwork, and we sense why failures of such may have weighed heavily upon the man's psyche.

And there is this theme from the very beginning and carrying throughout the work to form a culminating point at its conclusion: the arc and course of J. Allen Hynek's life coincided with the circuit of Halley's Comet, whom his parents introduced to the newborn Hynek and whose return was upon Hynek's mind as heralding his own death—if O'Connell does not exaggerate—coursing as a leitmotif throughout Hynek's life. One of the book's last vignettes is of Hynek, his wife Mimi, and close confidante Jennie Zeidman viewing the heavenly body on a cool Arizona evening in 1986, a trip that "completed the circle" of Hynek's existence.

The Close Encounters Man is not only about J. Allen Hynek, however, as it necessarily discusses the course of UFO history from 1947 to the man's death in 1986. Along the way, iconic UFO cases are presented and their importance assessed upon the general regard for and treatment of UFOs by the Air Force, the media, and the common people. Here author O'Connell's

background as a television screenwriter and science fiction buff is in evidence, as he argues for an interplay between these outside events and Dr. Hynek's career, focusing particularly upon those instances from the Thomas Mantell crash in January 1948 to the Pascagoula abductions in 1973, where Hynek became directly involved. Generally, O'Connell successfully negotiates a path between too much information, which would have turned his book into more of a UFO history than its size and intent would ever permit, and too little explanation, which would render the stories as meaningless asides.

In particular, biographer O'Connell has skillfully interlaced developments in Hynek's mainstream scientific and academic pursuits with those in his increasing interest and involvement in UFOs, setting these against the larger backgrounds of the course of history and ufology, particularly in the United States. Throughout, O'Connell provides valuable insights as to why Hynek was, while reacting to these outside forces, such a seminal figure in shaping public attitudes toward them. Thus, early work with the proximity fuze allows Hynek to contribute to the WWII effort while at the time experiencing the power of collaboration, which could usefully be applied to such constructive purposes as cancer research and fundamental nuclear studies; the 1957 launch of Sputnik I thrusts the mild-mannered astronomer into the media spotlight as he and Fred Whipple explain its technical implications and do much to calm the politically based fears of the nation; the notorious "Swamp Gas" fiasco of 1966 pushes Hynek back into the public eye as the "go-to" man for a field that had become less secretive; and simple coinage of the "Close Encounters" portion of a UFO categorization system would resonate in a major box-office smash-hit movie and forever enshrine the man in media lore. And the evocative power of "Swamp Gas" and "Close Encounters" will likely ensure that those terms stay in the lexicon even after J. Allen Hynek's many other contributions are forgotten. But O'Connell assures those achievements *are* known and understood.

A major contradiction or struggle running through *The Close Encounters Man* is that between Hynek the Timid and Hynek the Bold, in speaking up for himself and challenging the system when necessary. Though acknowledging observations by such people as Jacques Vallee on Hynek's aversion to "confrontation and scandal" (p. 253), O'Connell accepts Hynek's own explanations for his general approach. O'Connell defends Hynek for emphasizing cooperation and being politic, like Kepler, in subordinating his tactical urge to speak out, against the greater strategy of maintaining access to UFO information he did not control. There were times, as in the fatal Mantell crash and the August 13, 1947, Snake River Canyon multiple witness case, where Hynek later wished he had not been

so quick to "toe the party line" with a dismissive explanation. On the other hand, O'Connell shows Hynek speaking out fearlessly in public, albeit in urbane tones, against the unscientific stance and tenor of Drs. Urner Liddel and Donald Menzel at the October 1952 Boston meeting of the American Optical Society (pp. 84f), and in his letter published in the October 1966 journal *Science* even while still an Air Force consultant.[3] Contrasting with Hynek's keeping of information from the 1953 Robertson Panel, the UFO-debunking results of whose deliberations had been largely predetermined (p. 88), there is Hynek's April 5, 1966, testimony against his own employer, as it were, before the open hearing of the U.S. House Armed Services Committee for the outside and independent review of Project Blue Book. And differing with Hynek's private efforts to "tone down" the rhetoric with Carl Sagan in their public pronouncements and occasional in-person contests, there is Hynek's fury at premature cancellation of "Project Star Gazer" (p. 171) and snarky letter Hynek apparently wrote Northwestern Dean of Sciences John Cooper on the University's decision not to submit a proposal for a $250,000 Air Force contract funding a project to transfer Project Blue Book case reports onto computer files.[4]

Certain other themes flow throughout this story of Dr. Hynek's life, supported by events, quotations, and, in many cases, references back from the concluding portions of the work that bring these themes to their own maturation and make the book's end more satisfying and natural. An early attraction to mysticism, latent throughout Hynek's life but underplayed, we are told, through the exigencies of presenting a "proper," mainstream appearance lest his "day-job" be compromised and his more borderlands assignment receive more raised eyebrows than it already did, resurfaces during the later Hynek years. The human fascination with Mars forms a backdrop to Hynek's love of mystery and desire to explain it; O'Connell believes that Mariner 4's effect upon "Mars dreamers" was an impact similar to the more obvious one the first Russian satellites had previously upon the general public (pp. 173f). The Mars matter also embodies the contradictory nature that O'Connell perceives in 20th-century science—at one and the same time expanding upon, and rejecting, the human sense of wonder. Lastly, Hynek's appreciation that each UFO case usually involves at least one, and often several, witnesses who have been flummoxed by what they have experienced and nevertheless tried to represent it faithfully is noted throughout the biography.

The Close Encounters Man offers numerous observations that will intrigue readers. Aside from the general value for those steeped in only one of Hynek's several fields of endeavor, such things as O'Connell's suggestion that Major Hector Quintanilla "planted" an article in the local

Detroit, Michigan, newspaper on the morning of Hynek's fateful "Swamp Gas" press conference stand out. Hynek's exposure to an "Elements of Astronomy" book during a youthful bout with Scarlet Fever will help explain the eventual course taken by his educational and career choices. Ufologists will also appreciate what Hynek said about his belief that Project Blue Book was not funneling the high strangeness cases across his desk (p. 321). And Hynek's own statement that it was only in the Fall of 1966 that he really changed his mind about UFO research[5] will surprise those who think back to his early 1950s review of the Thomas Mantell incident and his general surprise that the larger UFO phenomenon he had helped to debunk during his earlier Air Force connection had still endured.

O'Connell utilized the J. Allen Hynek Center for UFO Studies' large holding of reports, letters, papers, and other documentary and human resources, and visited other archives to gather additional information. The material not only seems well-integrated into the text, but its vignettes do much to increase our appreciation of Hynek the man. O'Connell performs a juggling act in interweaving the course of Hynek's personal life with his academic and ufological duties and his evolving sense of what is going on and the great mystery that remains. At times, therefore, the narrative bounces around between developments in one area and another, in order to make sense of the progression in each field. Yet rarely if ever is the unity of the common thread uniting the life and book threatened. Each chapter's length seems appropriately tailored to the particular aspect of Hynek's career under consideration, and often a pithy but intriguing first sentence or powerful last comment will prepare the reader for what is to come next. The author's deft eye for spotting an evocative moment, illustrative example, or summative quotation is evidenced throughout. Thumbnail descriptions of the characters who will interact with Hynek are generally well done. There is even a moment where author O'Connell successfully allows the action to move through a series of different but thematically connected quotations—a rare feat in this reviewer's experience. Generally, The *Close Encounters Man* has been well-proofed, unfortunately not that common a practice in UFO books and even among recent works in other fields—and thus worthy of note here. Even the fonts and titles in the "Contents" pages perhaps unconsciously intrigue the reader at the book's very beginning, and intimate this will be, at the least, potentially a very interesting read.

O'Connell combines footnotes and asterisks to good effect, using the former generally to support certain assertions; the latter to explain unfamiliar terms or ideas. However—and this is a major problem for anyone wishing to check references and make their own evaluations of source-use—literature references resolve no further than the document level. Thus, while

a short article might require only a scan of two pages to locate a referenced passage, the same is not possible when the source is in a book such as the Hynek–Vallee collaboration *The Edge of Reality*. And here the absence of a separate bibliography is an especial problem.[6] For comparison, biographers of Carl Sagan William Poundstone (1999) and Keay Davidson (1999) both integrate separate Notes and Bibliography to facilitate readers' checking their sources. And references seem to be lacking for statements that might appear to need them. This fact alone would affect *The Close Encounters Man* being considered the "definitive" biography of Dr. Hynek. And this concern is compounded for those who question interpretations or discern gaps in the narrative for cases familiar to them.

There is insufficient consideration of the important role that Hynek's second wife Mimi played in his career, as she came to be a force in the Center for UFO Studies' work during Dr. Hynek's life, as well as afterwards. The limited number of family members O'Connell was able to interview may have played a part in this matter. Hynek's chosen successor as CUFOS President and Scientific Director Mark Rodeghier[7] accords Mimi Hynek a good portion of the credit for the Center's success during Hynek's life. People coming to the Center in the '70s and early '80s met Mimi as well as Hynek, and she ran the Center's book sales and edited books by its members as an intellectual partner.

By closing his consideration of Hynek's legacy at the latter's death, O'Connell missed a chance to give full value to that creation. For the Center reorganized itself and maintained the *International UFO Reporter (IUR)* and *Journal of UFO Studies (JUFOS)* traditions, conducted investigations including, of course, that of Roswell, and fostered the work of investigators such as Ted Phillips and Jennie Zeidman. And O'Connell has been criticized by Jerome Clark (2017:60) for not contacting more of Hynek's former colleagues. In fairness, O'Connell has answered this criticism by observing that some of those people refused in whole or in part to talk to him. The narrative runs 350 pages as it is, so some of these deficits are understandable, if lamentable.

More serious is the treatment accorded Hynek's Arizona sojourn, with its interplay between the activity of Tina Choate, Brian Myers, and a benefactor who failed to deliver, on the one hand, and the Illinois Center that Hynek left, on the other. O'Connell explains this as due to his inability to contact the Arizona principals until the eve of the publication deadline, and only later yet to secure their side of the story. But the Illinois perspective has not been represented to the same extent. For instance, the book incorrectly states that the "officers of CUFOS had pointedly changed the name of their organization to the J. Allen Hynek Center for UFO Studies; they then sent

Choate and Myers a letter demanding that Hynek's name not be used in association with any of ICUFOR's activities. This saddened Allen." This name change could not have "saddened" Dr. Hynek for he had passed before it happened.[8] Hynek's personal style of the *bon vivant*, conversant in good wine and amicable discourse among friends, could have been better emphasized. But O'Connell does an excellent job of bringing out Hynek's sense of humor.

While editorial changes helped maintain the pace and artistic quality of *The Close Encounters Man*, sometimes this occurred at the expense of the historical narrative. The account of successive Air Force explanations for the Roswell incident is truncated to the point of confusion; the "very short while" that page 331 intimates occurred between the first "flying disc" and the third Project Mogul story was actually on the order of 38 years. And the "fireplace in Maine" O'Connell invokes at the end to inject the reader more directly into the Hynek story should be situated in Ontario, not New England (p. 350). O'Connell would have included more such material about these events and cases, benefiting from his considerable knowledge of and experience in the field of ufology, but for the editorial imperatives of keeping the book's page-count down. As one example that O'Connell mentions on his own *High Strangeness* website, the remarkable 1955 Kelly-Hopkinsville "goblins" case was basically excised from the manuscript, a deficit O'Connell has subsequently made good in a series of posts online.

The March 1966 Michigan "Swamp Gas" story was much cut due to space considerations, although this series of events was pivotal in Hynek's career and, as O'Connell notes, both a "low point" in Hynek's own estimation and the thing that most elevated him in the public eye and thus extended his ability to contribute further to our serious consideration of the UFO phenomenon. This pruning mars the timeline of the Dexter-Hillsdale and associated "flap," as it appears that the March 21st experience of the Hillsdale College co-eds, their housemother, and the local Civil Defense Director was a single event, rather than two separate sightings (p. 179). The "wild ricochet of the swamp gas statement" on page 205 is also much less powerful than it would have been had the description of the sound the Dexter UFO supposedly made as it took off from the surprised witnesses on the night of March 20th actually been included in the text. At the March 2016 presentation in Ann Arbor dedicated to Michigan's then-50-year-old "Swamp Gas" case that was so pivotal in Hynek's career, O'Connell evinced a much more masterful command of the material and penetrating thought about its importance than the relatively few pages allowed him in the book.

Critical reviewers may somewhat discount *The Close Encounters Man* for occasional exaggerations and its downright hyperbolic subtitle: *How One*

Man Made the World Believe in UFOs. As Jerome Clark (2017) and David Halperin (2017) have pointed out, Dr. J. Allen Hynek did *not* in fact "make" the world believe in UFOs. One wonders if this isn't a commercial addition. Clark rather hits the mark in the title to his *Fortean Times* review: Hynek *did* make UFOs respectable for a wide swath of America and the world.

In the overarching matter of J. Allen Hynek's legacy to society at large, biographer O'Connell's experience in both ufology and writing successfully for popular culture becomes very cogent and powerful.[9] Does O'Connell over-promote both the impact that media such as movies and TV, in addition to books, has had upon public perceptions of and attitudes toward unidentified flying objects and their study? That is debatable, and beyond this reviewer's competence to assess. But O'Connell's case is well-argued and certainly deserves strong consideration.

Some may quibble with O'Connell's question to self: "What kind of man, I wondered, could calmly stand at the center of a decades-long conflict and be equally despised by both sides?" *Despised* must be too strong a word to use for all but a relatively few people who interfaced with Hynek. Perhaps one or two of Project Blue Book's heads might have entertained that dark emotion, but even that seems speculative, and the brief for applying it to McDonald and Sagan doesn't persuade, either. O'Connell suggests that the whole state of Michigan was enflamed against Hynek in March of 1966 for his "swamp gas" remark. Besides certain Michigan professors having suggested something of the sort to Hynek as a diagnosis for the strange phenomena reported at Dexter and Hillsdale, this reviewer was there at the time and does not remember matters being that universally acrimonious.

In fine, Mark O'Connell's book about Dr. J. Allen Hynek reflects some of the dichotomy of the figure the author puts before us. As with any such initial biographical effort—and even many treatments done much longer after a person's passing—it falls a bit short in certain demonstrable areas. But knowledgeable readers, including those who knew Hynek best,[10] agree that it well reflects the man they once knew and still remember. The book gives us a far more-rounded view of Hynek than anything done since the man's passing in 1986. And at this writing it is hard to imagine anyone being able to replicate the significant work that O'Connell has done on the book, and certainly to be capable of surpassing it in its easy grace and readability. Considering that he remains as one of the formative figures in the history of a field that has persisted in popular culture for more than 70 years, Dr. J. Allen Hynek's biography was long overdue and this effort is both needed and welcome.

The Close Encounters Man is a major achievement, through the sheer amount of effort and accomplishment it demonstrates applied and achieved by Hynek in making a case for the scientific prosecution of ufology and its

merit as a legitimate field of inquiry. The style and wit with which it has been written will serve a large audience, and perhaps fire within them some of the passion for the subject that Hynek so came to love. Mark O'Connell's book deserves reading, certainly within the scientific community, and just as importantly among the larger literate public, who have heard of "swamp gas" and "close encounters," and who may sometimes, like Hynek himself, look up into the sky and wonder at the majesty and mystery of it all.

Notes

[1] Halperin, D. (2017). "The Close Encounters Man"—Mark O'Connell on J. Allen Hynek, *Journal of a UFO Investigator*, November 29, 2017. https://www.davidhalperin.net/2017/11/. John Franch (2013) luxuriates in this explanation.

[2] O'Connell says that Hynek knew that his Detroit statement "would offend and anger everyone he had ever recruited to the UFO cause" (p. 194).

[3] pp. 201–204. Page 203 gives Hynek's list of "seven popular misconceptions" about UFOs. See also Hynek (1972:9–11).

[4] p. 225. O'Connell mentions Cooper's August 1966 letter to Hynek, so it is here inferred that the Hynek quote comes from a written response directly to Cooper, but source locations are not provided in the text.

[5] p. 222. "'In the fall of '66 was the real time I changed' he told Vallee." O'Connell's footnote references Hynek and Vallee (1975). O'Connell does not provide a page number.

[6] See, for instance, Chapter 15 and footnotes 11 and 12 references to Saunders (1969) and Hynek and Vallee (1975).

[7] In Jerome Clark, *The UFO Encyclopedia: The Phenomenon from the Beginning*, second edition, Detroit: Omnigraphics, 1998, Volume 1: A–K: Hynek, Josef Allen, pp. 531, 533.

[8] pp. 336f. The CUFOS officers did not change the organization's name until *after* Hynek's April 27, 1986, death, which is first announced as a late addition to *IUR, 11*(2) (March/April 1986), and reflected in the name change to the J. Allen Hynek Center for UFO Studies in *IUR, 11*(3) (May/June, 1986), p. 2. The change by CUFOS Board of Directors vote is explained in that issue's page 12 as the concluding part of new Center Director Mark Rodeghier's tribute to Dr. Hynek. Vallee's journals are inaccurate in this regard and another primary source should have been consulted for these statements.

[9] Mark O'Connell teaches screenwriting at DePaul University, has worked on films with Disney and DreamWorks Animation, among others, and his television achievements include *Star Trek: Next Generation* and *Deep Space Nine* episodes.

[10] The Extraordinary Legacy of Dr. J. Allen Hynek—The "Close Encounters Man," *The Oz Files*, http://theozfiles.blogspot.com.au/2017/05/, May 25, 2017; O'Connell, "Bravo, UFO!," April 9, 2017, and *High Strangeness*, April 9, 2017, and "Crying UFO Tears," August 17, 2017, all 3 pieces at http://www.highstrangenessufo.com/.

—William Murphy

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BOOK REVIEW

Into the Grey Zone: A Neuroscientist Explores the Border Between Life and Death by Adrian Owen. Guardian Books, 2017. ix + 304 pp. £16.99 (hardcover). ISBN 978-1-78335-098-8.

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Dramatic modern advances in emergency and resuscitation medicine, starting perhaps with the development of effective mechanical ventilators in the mid-20th century, have created a large class of persons who in earlier times would almost certainly have died, but who can now go on existing, suspended at least temporarily in a state somewhere between death and the conscious life they formerly pursued. A very wide range of brain injuries lead first to *coma*, in which the patient shows no sign of conscious *awareness*, or even of *wakefulness*, in which eye openings and closings indicate the presence of a sleep/wake cycle unconsciously mediated by structures in the brain stem. Following emergence from coma, which may take days to months or more if it happens at all, patients typically show signs of wakefulness without conscious awareness—they are then in a so-called *vegetative state* (VS). For many this state becomes permanent, but some go on to a more recently described condition called the *minimally conscious state* (MCS), in which signs of conscious awareness can be detected by careful neurological examination (see Laureys & Tononi 2009: Chapter 14). A very few such persons ultimately progress to more or less full recovery, but another and particularly horrifying possible outcome is the "locked-in" state, in which a patient is fully conscious but has extremely little or no capacity for voluntary motor action. A famous modern example is that of Jean-Dominique Bauby, author of *The Diving Bell and the Butterfly*, who suffered a stroke to his upper brainstem and awakened 20 days later to find himself fully conscious but capable only of blinking his left eye. A tiny fraction of surgical patients find themselves in similarly terrifying conditions caused by the combination of muscle relaxants with insufficient levels of anesthetic agents (Kelly et al. 2007:387 n. 18).

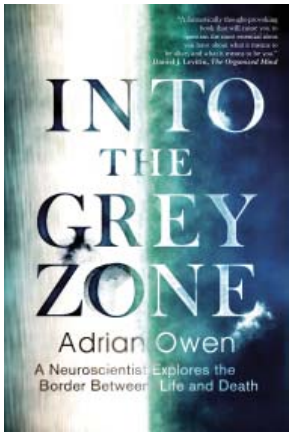
The distinction between VS and MCS is often difficult to make, clinically, and there are high rates of error in both directions. Skilled neurologists are good at making it, given sufficient information, but they see patients intermittently at best and not for long. Grieving family members and loved ones, on the other hand, may spend far more time with the patient

and thus have much greater opportunity to observe relevant evidence, but as in the infamously sensationalized case of Terri Schiavo's parents they are also far more vulnerable to over-interpreting what they observe as evidence of awareness and potential recovery.

Against this backdrop, British neuropsychologist Adrian Owen describes in this engaging new book the 20-year trajectory of his increasingly successful use of modern functional neuroimaging methods including PET (positron emission tomography), fMRI (functional magnetic resonance imaging), and most recently EEG (electroencephalography) to detect signs of conscious awareness in patients who had been diagnosed as vegetative using standard neurological criteria. He tells this story primarily in terms of gripping accounts of 10 of his own cases, interspersed with related autobiographical material of an often very poignant sort, and with occasional reflections on the weighty ethical and legal ramifications of his research. Let me next sketch the highlights of this remarkable journey.

The story begins with "Kate," in whom encephalomyelitis had produced widespread white-matter destruction. In a hastily organized PET study, Owen and colleagues carried out 12 scans in which they displayed images of Kate's family members and friends on a monitor inside the scanner, and discovered to their surprise that her face-recognition area (fusiform gyrus) responded selectively to those images in comparison with responses to unfocused versions of the same pictures. These preliminary findings were published as a letter in *Lancet* (Menon et al. 1998) and resulted in a substantial media uproar. Owen felt that he had made contact with Kate, but critics argued that the observed activations might have been automatic brain responses, and were insufficient to demonstrate the presence of conscious awareness. She later slowly recovered to a substantial extent, and reported having experienced intense feelings of pain, terror, anger, and thirst during her supposedly vegetative period (pp. 36, 39). In a still later conversation, Owen deliberately declined to ask her whether she remembered her scanning session (p. 41).

Next comes "Debbie," victim of a head-on car collision resulting in severe anoxia, with damage to the upper brainstem and absence of pupillary reflexes. PET scans were again carried out, but this time the experimental design contrasted responses to meaningful words (two-syllable nouns) versus carefully matched bursts of noise—stimuli crafted by colleagues proficient in psycholinguistics The switch to auditory stimuli was motivated by the fact that Kate's eyes had been closed during 3 of her 12 scans. The main result was that areas of the brain known to be involved in speech processing were selectively activated in Debbie's brain by the words, but not by the noise controls. Possible indications of residual awareness had thus again



been found, although it was again not possible to conclude with certainty that awareness was really present (Owen et al. 2002).

"Kevin," the victim of a massive stroke involving the brainstem and thalamus, was studied next, again using PET in conjunction with auditory stimuli provided by Owen's psycholinguistics colleagues. The stimuli this time consisted of whole sentences, each of which was varied systematically in intelligibility by addition of differing amounts of background noise. These stimuli had been shown in normal volunteers to evoke activation in specific speech-processing areas, with the level of activation proportional to the difficulty of comprehension. A patient showing similar effects, Owen reasoned, might plausibly be thought to be comprehending the sentences, and hence to some degree be conscious. The original PET study was repeated with Kevin nine months later, together with a related preliminary study featuring two notable advances: First, the scans were carried out this time using newly available fMRI technology, which has much better spatial and temporal resolution and is free of the limitation on PET scanning imposed by considerations of radiation burden. Second, the stimuli were now sentences carefully calibrated in terms of the amount of lexical ambiguity they contained; these had been shown in normal volunteers to produce a more complicated pattern of brain response, including areas of the frontal lobe that became active in proportion to the amount of ambiguity needing to be resolved. All three studies yielded similar results, with Kevin's brain consistently producing responses resembling those of the normal volunteers (Owen et al. 2005). Owen now felt confident he had obtained convincing evidence of awareness in a VS patient and presented these results "excitedly" to colleagues, but to his chagrin they remained unpersuaded (pp. 85–86). It is perhaps also worth noting here that Kevin has remained VS.

Following this disappointing reception of his findings, during a 4-month sabbatical in Australia, Owen realized that what he needed to do was to show that a patient could *voluntarily* perform mental tasks that had predictable and divergent neurophysiological consequences. This would in principle allow persons incapable of voluntary motor acts of the sorts relied upon by neurologists, to provide analogous evidence, through brain activity alone, of their continued conscious presence. He returned to Cambridge, and following careful pre-testing of a variety of possible tasks settled on

two that reliably produced radically divergent patterns of brain activity in healthy volunteers. The first—imagining oneself playing tennis—robustly activated premotor cortex, while the second—imagining oneself walking through the rooms of one's own dwelling—similarly activated a spatially distant area called the parahippocampal gyrus. When these tasks were first presented to VS patient "Carol" in an fMRI scanner, her brain activated in strikingly similar ways. These and other results from Carol were published in a one-page article in *Science* (Owen et al. 2006) which attracted enormous media attention and convinced most readers, myself included, that Carol probably *was* to some degree conscious. A few very determined skeptics suggested that perhaps just hearing the instructions was sufficient to elicit automatically the corresponding patterns of activity, but that possibility was ruled out by further experiments in which healthy volunteers listened to the instructions but deliberately avoided carrying out the tasks, and failed to produce the normal activity patterns.

Over the next few years this 2-task procedure was carried out with 54 additional patients; 23 of these had been diagnosed VS, and 4 succeeded in the tasks (Monti et al. 2010).

Readers will likely anticipate what comes next: If one can reliably produce distinct and easily recognizable patterns of brain activity by performing two different mental tasks, then perhaps one can use those tasks to answer yes/no questions in appropriate ways. After verifying this in himself and 16 other volunteers, Owen tried it first in a long-distance fMRI scanning session with an East European VS patient named "John" who had suffered traumatic brain injury in a motorcycle accident five years previously and was being studied at the facilities of Steven Laureys and his team at Liége, in Belgium. During that single brief session John correctly answered 5 yes/no questions about himself and his family, and Owen began to think about the implications: From a clinical point of view it would be wonderful if we could ask such patients whether they are in pain, and if they respond "yes" give them pain medication and verify that it works. But what if we ask whether they want to live and they say "no"—what then? Increased capacity to communicate with severely brain-damaged persons clearly carries with it momentous potentials for both good and ill, and we will ultimately have to come to terms with this.

By this time Owen's work had attracted an enormous amount of mostly positive attention, and he moved to a lavishly funded new position at the University of Western Ontario in London, Ontario. There he employed the 2-task procedure with a patient named "Scott," who had been nominally VS for 12 years after being T-boned at the wheel of his car by a policeman traveling at high speed on the way to a crime scene. Scott

began, dramatically enough, by answering "no" when asked whether he was in pain during a session filmed with Owen's approval by the BBC. He went on during the months that followed to answer numerous other yes/no questions, demonstrating that he knew who and where he was, remembered his personal history prior to the accident, knew the names of his caregivers, and remembered other persons and events from the period of his VS. This was communication on an unprecedented scale with a person repeatedly diagnosed as VS by a highly competent neurologist, and it validated the confidence that Scott's parents had expressed all along that their son was still there. Sadly, Scott died about a year later.

The next patient, Abraham, had suffered an intraventricular hemorrhage due to an aneurysm in his anterior communicating artery. Owen uses this case primarily as a vehicle for discussion of the gut-wrenching life-and-death issues involved in such cases, touching also upon various others including those of Terri Schiavo, Karen Quinlan, and Nancy Cruzan that had attracted large amounts of media attention. No scanning was performed, and Abraham died in the hospital.

Having by now discovered that highly specific probes such as the tennis/house tasks sometimes failed in patients who could be shown in other ways to have some degree of residual awareness, Owen and his expanding research group next began to explore "naturalistic" paradigms that could potentially canvas brain function in a more general and searching fashion and hence detect awareness more reliably. A high point of this effort is their work with a short but intense Alfred Hitchcock film called *Bang, You're Dead*, about a small child who discovers a revolver and some bullets and begins to play with his discoveries. The basic idea is that the film places a variety of strong demands on the viewer's attentive, executive, and affective capacities, demands which result in a surprisingly consistent dynamic pattern of fMRI responses in normal volunteers. Owen describes vividly the initial use of this paradigm with a patient named Jeff Tremblay, who had been nominally VS for 15 years following cardiac arrest produced by a kick to his chest, but who nonetheless displayed fMRI response patterns strikingly similar to those of normal volunteers while watching the movie—including activation of frontal and parietal brain areas thought to be required for understanding its dynamically unfolding plot (Naci et al. 2014, Naci, Sinai, & Owen 2017). As Owen himself somewhat oddly puts it,

> We had shown for the first time that the brain activity produced by similar conscious experiences in different individuals could be used to infer conscious awareness in physically nonresponsive patients without any need for self-report. (p. 204)

The next case, Juan, is the most interesting of all. Upon arrival at the hospital following a choking incident, he had a score of 3 out of 15 on the Glasgow Coma Scale—the worst possible score—and a CT scan showed widespread diffuse white matter damage apparently caused by the resulting anoxia. He was declared vegetative after remaining totally unresponsive for two months, but his parents subsequently transported him from the hospital to visit Owen's group for 4 days in hopes that their neuroimaging procedures might suggest some possibility of recovery. Neither the tennis/house task nor the Hitchcock movie, however, revealed any clear evidence of residual awareness, even after repeated testing. At this point Juan's future looked bleak at best. A routine followup call to his parents seven months later, however, revealed that against all expectations he was well on the way to recovery—eating, walking, and talking. Subsequently, through further interactions with Owen and his team, Juan demonstrated that he remembered not only people and events from the neuroimaging sessions but even earlier events that had occurred in the hospital shortly after his admission. Owen acknowledges never having seen "*anything* remotely like Juan's recovery" (p. 209, italics his) and being mystified by many aspects of the case (p. 215), but he never comes directly and fully to grips with its real challenge. I will return to this shortly, after completing my summary of the book's main contents.

By this point Owen had recognized that his fMRI-based procedures, despite their demonstrated virtues, were not going to be the full answer to what was now emerging as a major medical need for fast, cheap, and portable bedside testing procedures. Good MR scanners are still extremely expensive, after all, and patients have to be conveyed to the machines. To this end he began to investigate the possible use of EEG procedures, in which he had shown surprisingly little interest up to this point in the book. His initial foray in this direction was reported by Cruse et al. (2011), who found 3 of 16 VS patients able to produce fairly distinctive EEG patterns when asked to imagine performing divergent motor tasks (squeezing all fingers of the right hand into a fist *vs*. wiggling the toes of both feet). Only ¾ of the healthy controls succeeded with this protocol, however, suggesting that there remained plenty of room for improvement. The state of this ongoing development as of mid-2015, including its embodiment in a dedicated "EEJeep", is described by Owen in conjunction with the case of patient #10, Leonard, who in 2010 had suffered cardiac arrest while asleep. His wife had detected the problem and called for EMTs, but it was on the order of 15 minutes before they arrived and were able to restart his heart. Subsequently diagnosed as VS, Leonard had shown no signs of awareness in prior fMRI scanning by Owen's team with the tennis/house procedure,

but his wife invited retesting with the new EEG routines, which at this point relied upon possible differences in the neuroelectric responses evoked by speech sounds *vs*. meaningless noise, or by pairs of words that were related versus unrelated in meaning. Once again, no signs of awareness were detected.

In his final chapter—"Reading Minds"—Owen turns to the future of grey-zone science. EEG paradigms now represent for him the growing edge of this development, and he has recognized the deep affinity between his own ongoing work and a burgeoning area of research on "brain–computer interfaces" (BCI), much of it devoted to development of prostheses for fully conscious war veterans who have lost motor organs. He imagines a bright future in which sophisticated artificial intelligence techniques combined with enhanced EEG recording capabilities (possibly including arrays of electrodes implanted in the brain) will enable millions of brain-damaged and disabled persons to communicate effectively with their caregivers and loved ones, and to take back control of their own lives. He even imagines a scenario in which an individual who had been brain-damaged in a criminal attack provides investigators with information enabling them to identify and capture the attacker. All of this, he repeatedly suggests, flows from recognition and acceptance of the *fact* that we are nothing more than our brains (see for example pp. 27, 68, 72, 225, 255).

The book ends with a brief but poignant Epilogue, Acknowledgments, extensive chapter-by-chapter Notes including references to key papers, and an Index.

Turning now to evaluation of the book, the first thing that must be said is that Owen and his colleagues deserve great credit for systematically and doggedly opening up this new window into states of impaired consciousness in brain-damaged persons. I have no doubt that some nominally VS patients are in fact consciously aware to some degree, and the ability to detect that fact using neuroimaging methods certainly carries enormous implications for improved diagnosis and treatment going forward. The techniques they have introduced will continue to improve, and I think it essentially certain that standardized diagnostic procedures will soon begin to incorporate them.

That said, however, I must next focus on several aspects of his presentation that I find less than satisfactory. I'll begin where he ends, with the prospects for "mind-reading" by machines. This is potentially a big subject in itself, but in brief I think Owen is overly impressed with glitzy technologies in general, and with this one in particular. A particularly startling specimen occurs on p. 252, where he exclaims "Emerging technologies will undoubtedly one day allow us to *read* the minds of others. Not in the rudimentary sense that we do already—decoding yes and no responses

based on changes of fMRI activity—but in the sense of interpreting and understanding exactly what another person is thinking based solely on some sort of readout from his or her brain" (italics his).

As in the AI world generally, enthusiastic researchers have been quick to suggest that the rather modest successes achieved so far represent first steps leading inevitably to eventual complete triumph. In this case that is anything but certain, however, and in fact there are many reasons for doubting that anything on this scale will ever be possible. For starters, all existing neuroimaging technologies have significant limitations in terms of spatial and temporal resolution and the manner of coupling between the measured signals and the underlying brain activity, and it is not self-evident that we could ever measure patterns of brain activity at the requisite level of detail even if the postulated highly specific brain–mind correlations existed. There must also be vast numbers if not an infinite number of mental states, and specific phenomenal contents with potentially recognizable physiological correlates often occur together, or as components of some larger organization. These are already massive practical obstacles, but they pale in comparison with still deeper issues of a more abstract and philosophical sort: In particular, anyone who imagines that the correspondence between mental states and brain states is clear and consistent enough to support full-scale mind-reading by machines should also consult the weighty arguments against this possibility by philosopher Stephen Braude (2002:123–140 and Part II). For example, brain-states corresponding to a mental image of an old rabbi are sure to differ endlessly in detail, like the images themselves, both within and across individuals, and even explicit knowledge that such an image is present as a component of some mental state would ultimately reveal very little about the total intentional content of that state in the specific context in which it occurs. On the physical side, meanwhile, despite their gross overall similarity in appearance, human brains vary widely in the details of their structural and functional organization, implying that specific mental-state "types"—even if such things existed, which appears highly doubtful—would likely take on widely varying appearances across subjects in terms of the accompanying brain activity. Much of the work to date on "mind-reading" by machines has in fact focused on artificially simple tasks such as discrimination of brain responses to small numbers of distinct sensory stimuli, usually in terms of activation patterns evoked by those stimuli in the corresponding primary sensory areas of the brain. Even in that restricted setting, brain damage could well disturb whatever correlations antecedently existed, and things will certainly get much tougher as we move toward more central parts of the mind.

I do not mean to discount the value of BCI research, because for anyone who has been locked-in and unable to do anything at all, the ability to answer a simple yes/no question, even if it takes 5 minutes, already represents essentially infinite progress. But although some practically useful advances in this direction have already occurred, and more are sure to follow, talk like Owen's as quoted above seems to me nothing short of unbridled science fiction—fiction, moreover, which can be pernicious to the extent it engenders unrealistic hopes in persons struggling to care for their brain-damaged or locked-in loved ones.

My second main concern is that Owen overstates considerably what he has definitely discovered about the mental lives of his patients. He seems to see little middle ground between being truly vegetative and being fully intact and conscious. On p. 3 of the Prologue he announces dramatically that ". . . we have discovered that 15 to 20 per cent of people in the vegetative state who are assumed to have no more awareness than a head of broccoli are fully conscious, although they never respond to any form of external stimulation." For all intents and purposes, that is, he is declaring such persons to be locked-in, although he hesitates to apply that term (p. 123). But the ensuing narrative repeatedly exaggerates what he actually knows about his patients' mental condition: Thus for example, "Carol was hopelessly disadvantaged by her useless body but was nevertheless still in there—her personality, attitudes, beliefs, moral compass, memories, hopes and fears, dreams and emotions" (p. 113). Similarly, Owen declares of Scott, the yes/no test subject, that "On that day, and on many occasions in the months that followed, we *conversed* with Scott in the scanner" (p. 162, italics mine), even though he himself acknowledges a short time later that "We had never had a real conversation" (p. 167). Jeff Tremblay, shown the Hitchcock film, "was conscious and experiencing the movie just as you or I would" (p. 201). Again, "Juan remembered everything about his first visit, down to the tiniest detail" (p. 214). Additional examples can be found scattered through the text.

Owen's narrative of mental intactness is reinforced, moreover, by parallel exaggerations about similarities in patterns of brain activation between patients and normals: Thus for example Debbie's brain "responded to speech and noise bursts just like yours or mine" (p. 57), and Kevin's temporal lobe "lit up in exactly the same way it had in the healthy volunteers" (p. 85). When asked to imagine playing tennis, Carol "would activate her premotor cortex just like healthy volunteers" (p. 109), and when asked to imagine walking through her house, "her pattern of brain activity was identical to that of healthy volunteers" (p. 109). Owen acknowledges that when excited he is "famously prone to hyperbole" (p. 209), and there is

certainly plenty of excitement here, but this tendency goes beyond what seems proper even in a book intended for a popular audience. The 2006 *Science* paper on Carol, moreover, states that "Her neural responses were *indistinguishable* from those observed in healthy volunteers performing the same tasks" (italics mine), when in fact they were only *statistically*, not visually, indistinguishable, and occurred in brains that were probably in very different overall functional conditions; vegetative patients for example typically have resting rates of cerebral blood flow and metabolism that are far below normal levels, approaching those observed in deep general anesthesia (Laureys & Tononi 2009: Chapter 13).

What Owen was really talking about in his Prologue, of course, was people who have been *diagnosed* as vegetative, and question number one is whether those diagnoses were correct. I think the answer is often "no," and this brings me to a more fundamental issue. For someone who repeatedly describes himself as being interested in basic science, Owen makes distressingly little effort to connect his work with the massive contemporary literature on the neuroscience of consciousness. Let me explain: Over the last several decades, an overwhelming consensus has developed among neuroscientists that normal human conscious experience occurs only in conjunction with a brain that is capable of generating large-scale oscillatory neuroelectric activity cooperatively linking widespread cortical and subcortical territories (there remains plenty of disagreement as to exactly how the two are related, but that has no bearing on the following discussion). Owen's colleague Steven Laureys has done as much as anybody to situate grey-zone science within that framework, which entails as a general expectation that brain-damaged persons can only recover consciousness to the extent that their brains begin to function as they did before the injury, by virtue of re-establishment of metabolic activity and connectivity within large-scale thalamocortical networks (e.g., Laureys et al. 2005, Laureys & Tononi 2009, Laureys & Schiff 2012). Most of the literature on disorders of consciousness appears consistent with this picture: For example, strong somatosensory (wrist-shock) stimuli that are experienced as noxious and painful by healthy volunteers activate primary somatosensory cortex in vegetative patients in the normal way (because the sensory pathway itself remains intact), but that first-stage activation fails to spread as in normal brains to other regions of the cortical pain network (Laureys et al. 2002). Similarly, it has long been known that severely brain-damaged persons can sometimes exhibit behavioral signs associated with cortical "islands" of relatively preserved metabolism and neuroelectric activity that remain functionally isolated from the rest of the brain (Schiff et al. 1999). By contrast, genuinely locked-in but fully conscious patients

such as Jean-Dominique Bauby typically have normal cerebral blood flow and metabolism and normal (or only mildly abnormal) EEGs (Laureys & Tononi 2009: Chapter 15, Patterson & Grabois 1986).

Owen's own patients illustrate the fact that brain injuries themselves can take an indefinite variety of forms, and in general it is extremely difficult to know with much precision what happened in any given case. That problem is compounded, moreover, by the typically widespread and hard-to-track dynamic changes that follow over time in response to the original injury. As Owen himself acknowledges, "every brain is different, and every brain *injury* is different" (p. 225, italics his). So were his patients really all vegetative? For several of his most important cases I think there are good reasons to doubt it. Kate, for example, could apparently fixate on the displayed images, suggesting MCS. She also produced long-latency evoked-potential components, and of course she eventually recovered to a considerable extent. The Supplementary material for the paper on Carol shows that she displayed background EEG activity including alpha and beta frequencies. Jeff Tremblay appeared capable of visual tracking, and Owen himself suggests on that basis that he was probably MCS rather than VS at the time of his scanning.

I have no doubt, in sum, that neuroimaging methods can detect signs of residual awareness in some severely brain-damaged patients who are behaviorally unresponsive, and this surely represents an important advance in diagnosis and treatment. From a theoretical standpoint, however, most of Owen's patients do not seem to me to pose very clear-cut challenges to the conventional picture sketched above, and I see little justification for his central claim that large numbers of genuinely vegetative patients are in effect locked-in, totally intact and lucid conscious minds trapped inside shattered brains.

The main possible exception here, of course, is Juan, and this brings me to my final and most important concern. Owen never seems quite to appreciate or at least articulate the fact that if his central claim were true it would effectively falsify the contemporary mainstream neuroscientific consensus on consciousness and the brain as described above. Among all the patients described in this book, Juan certainly comes closest to reaching that threshold, and we have already seen how disturbing this was to Owen himself. But even in Juan's case, in my opinion, our knowledge concerning the functional condition of his brain at the time of the events he later recalled is not sufficient—at least not yet—to make that argument stick. But there are numerous other cases already in the literature that make essentially the same argument in a much stronger fashion, and it galls me that Owen makes no contact whatsoever with this large body of material. I

am referring, of course, to the hundreds of cases of near-death experiences (NDEs) occurring under extreme physiological conditions such as adequate deep general anesthesia and/or cardiac arrest. In circumstances such as these, the specific neurophysiological conditions thought by virtually all contemporary neuroscientists to be necessary for conscious experience are definitely abolished, and yet many persons subjected to those circumstances later report having had not just any old conscious experiences but the most extraordinary and transformative experiences of their entire lives. In many such cases, moreover, the experiences can be anchored to the period of brain impairment by the patients' ability to correctly report events occurring during that time (e.g., Holden, Greyson, & James 2009, Kelly et al. 2007: Chapter 6, van Lommel et al. 2001).

The inside front portion of the jacket material of Owen's book intriguingly poses the following question: "We have known for a long time that a body does not define a person—but what if a brain does not define a mind? What does it mean if a mind can exist unharmed within a deeply damaged brain?" That is indeed the theoretically most fundamental question, but Owen himself unfortunately fails in the end to come fully and directly to grips with it. The work described in this book is surely important, but its significance up to this point is almost entirely clinical, and not theoretical. One can only hope that at least some of the many able persons now working on grey-zone science will take the central message of this review to heart, and devote serious attention to cases of this most profoundly challenging sort.

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BOOK REVIEW

Consciousness: A Very Short Introduction second edition by Susan Blackmore. Oxford University Press, 2018. 152 pp., $10.46 (paperback). ISBN: 978-0198794738.

DOI: https://doi.org/10.31275/2018.1299

What is consciousness? What is this thing with which we are most intimate, yet remains outside of our best scientific understanding? In recent years, consciousness research has expanded its range of investigation, and these include new metaphysical approaches. However, we are still far from any kind of consensus on a theory of consciousness. In addition, scientists and philosophers remain divided on what a satisfactory theory or explanation might look like. Many are confident that consciousness will ultimately be explained through various materialistic processes that we do not yet understand. There are others who champion more radical approaches than more conventional, physicalist ones. Then there are those who insist that when we take the right approach, much of the mystery evaporates.

Consciousness: A Very Short Introduction by Susan Blackmore, falls into this latter camp. The book does offer some attractive features. Blackmore uses an extremely bare bones approach to present a considerable range of information within its slender volume. Overall, her style is concise and engaging. She also provides many useful and interesting summaries on current work in neurobiology and cognitive science.

That said, however, the book is flawed. As I'll discuss, the book is far from a neutral and even-handed treatment for various theories of consciousness. Blackmore doesn't waste much time before she begins to tilt the discussion toward her own view, which she calls delusionism. Alternate approaches and theories, especially ones that embrace a 'hard problem' view of consciousness, are given short shrift. While I believe most readers would prefer a more balanced introduction, materialistically inclined readers might find value in this slender volume. Nevertheless, the book might have been better titled 'A Very Short Introduction to the Delusionary Approach to Consciousness.'

Blackmore begins the book with a relatively clear exposition on the mystery of consciousness, also known as the mind–body problem. This problem is often framed as the hard problem, a phrase coined by the philosopher David Chalmers (1997). As Blackmore explains, Chalmers

divides the problems of consciousness into the easy ones and the hard one. The easy problems include those that can be characterized by some sort of function, such as perception, learning, attention, or memory. The hard problem is how to explain experience itself. That is, how do inherently subjective experiences, such as the taste of mango, the blueness of the sky, or the feel of wet sand beneath our feet, fit into an objective understanding of the world? Philosophers of mind refer to these varieties of subjective experience as qualia and they are at the heart of the hard problem of consciousness.

Blackmore elaborates on the problem of consciousness by giving us a brief look at Nagel's (1974) famous exploration of what it is like to be a bat. Nagel has famously characterized the consciousness of an organism as what it is like to be that subject, from the inside. According to Nagel, no matter how much we understand about the physical characteristics of the bat, including its echolocation and unique nervous system, there is no way we can really know the experience of a bat. Our understanding of physical, chemical, and biological laws, no matter how advanced, cannot close the gap between our own experiences and our objective understanding of the world with those of creatures quite different from us. This suggests for Nagel that inherently subjective experiences are not entailed by physical processes.

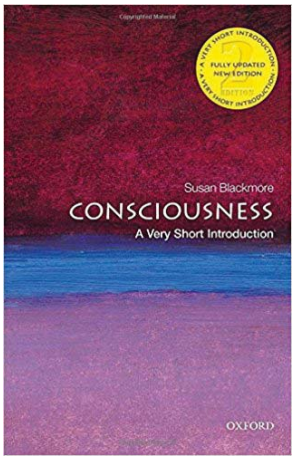
Soon after introducing us to the hard problem and the mystery of consciousness, Blackmore makes a rather sharp pivot in order to make her case that we are severely deluded about the nature of our experiences. Blackmore's priority is not to provide a relatively even-handed introduction to the theories on consciousness; rather, she organizes her book to make a case for her view of delusionism, which is similar to what others have termed illusionism and eliminatism. Early on, she frames the question of how best to think about consciousness between two general approaches: 1) as an "extra ingredient" to various functional aspects such as perception, memory, attention, learning, and so forth (the so-called easy problems) versus 2) something intrinsic to these functional aspects of cognition, so that no additional explanation is necessary. With this latter view, once we understand all the functional aspects of cognition, there is nothing else to explain. This being the case, Blackmore argues, the problem essentially turns on its head and we need to "explain why there seems to be a hard problem and why we seem to be having ineffable, non-physical, conscious experiences" (p. 10). I can note that Blackmore has a tendency throughout the book of associating inherent subjectivity, that is, the truly difficult part of the problem of consciousness, with such loaded terms as magic, supernatural, soul, and spirit. To Blackmore, it appears that the inherent

subjectivity of conscious experience might in some sense be comparable to a kind of obsolete religious belief.

Throughout the book, Blackmore gives us concise descriptions of various brain structures and processes. These are accompanied by well-labeled diagrams that accompany various mechanisms or neurobiological studies she discusses. A key characterization for Blackmore is that the brain is not similar to a computer with a central processor, but rather "a massively parallel and distributed system with no central organization, no inner sanctum where the really important bits happen" (p. 19).

Perhaps Blackmore's strength in the book is describing and summarizing a relatively large number (for such a small volume) of neurobiological and cognitive science studies. An especially important category of research for her is how we might be subject to perceptual illusions. For example, she discusses Libet's finding that our conscious awareness of a stimulus to the brain appears to lag the actual stimulus by half a second. Other cases include how the brain's processing seems to fill in gaps in our perceptions. There are also examples that include the puzzling ways our minds seem to shift from consciousness to unconsciousness when we are driving; or the ways our mind is somehow able to pick out from unintelligible streams of conversation at a party someone who is mentioning our name. The upshot is that brain processes produce experiences that are illusory in the sense that they deviate in significant ways from a straightforward and transparent reading of our environment.

But Blackmore devotes a mere five pages to a section that covers various theories of consciousness. (She does manage other brief mentions here and there in other parts of the book.) Most alternative theories are defined and discussed in no more than a paragraph. One by one, Blackmore dismisses a particular theory on the grounds that it cannot explain a particular cognitive puzzle, such as how the contents of our mind seem to go from consciousness to unconsciousness while we are driving a car. For example, on dual-aspect theories of mind, which posit that mind and matter are different aspects of a more foundational substance, Blackmore claims, "these include Chalmers' claim that consciousness is as intrinsic to the world as matter and energy, but these ideas provide no explanation for unconscious driving" (p. 45). Some readers might be left wondering whether a more developed or refined version of dual-aspect theory might do the trick, but this sort of treatment isn't feasible within such a short space. Similarly, Blackmore takes a whole paragraph to discuss Penrose and Hameroff's theory of 'orchestrated objection reduction,' based on an objective collapse of the wave function interpretation of quantum mechanics. Within their framework, quantum coherence is maintained within microtubules within the brain. Without



exactly explaining why, Blackmore argues that their model does not explain subjectivity.

Blackmore is an advocate for Dennett's multiple drafts theory of consciousness, although she doesn't spend much more time describing Dennett's theory than the others she dismisses. Dennett views the brain as a vast parallel processor that models something like a virtual computer. Within this virtual computer, diverse patterns of information arise, combine, and perhaps dissolve, perhaps like different drafts of a written composition. Dennett uses the notion of meme coined by Richard Dawkins to suggest how some patterns of information might arise and endure in the brain. When all is said and done, Dennett's theory claims that our consciousness is nothing more than the operation of a kind of software within the neural network of the brain, which in turn can be compared to a parallel processing computer. (For an excellent overview and critique of Dennett's theory of consciousness, see Searle 1997).

But what about the hard problem? Dennett simply dismisses it as a pseudo problem. To be more specific, Dennett simply does not recognize the inherently subjective nature of our experience, the qualia, as something that legitimately needs explaining. For Dennett, the only data that can be admitted into our scientific framework are that which is gathered through third person, objective methods. Otherwise, as far as Dennett is concerned, the data doesn't exist and should therefore be ignored. And like Blackmore, Dennett uses copious examples of the illusory nature of our perception and brain processes in order to argue that consciousness itself is some kind of trick. Needless to say, this is not a widely shared view among most scientists and philosophers. For Nagel (2017), faced with Dennett's efforts to convince us to reject our own intimate experiences, he recalls a Groucho Marx line: "Who are you going to believe, me or your lying eyes?"

Thus, Blackmore favors the views of Dennett and Patricia Churchland that consciousness is simply nothing more than the various mechanistic processes and functions of the brain. However, this sort of argument is highly vulnerable to the conceivability (of zombies) argument. Blackmore introduces us to this argument very early on, but doesn't really engage with it. (She calls it "daft" and then moves on.) In the present context, we can see the problem as follows. Suppose we claim, following Dennett and Churchland, that conscious experience is nothing beyond all the various

functions of the brain, such as perception, memory recall, learning, and so forth. After all, they argue that these cognitive functions can be simulated with computers, and we have made some progress identifying neurobiological mechanisms with each. Thus, every aspect of the brain can be understood in purely physical terms. However, the laws of physics and chemistry, which tells us everything we know about physical systems, do not say anything about consciousness. Then it seems to follow that we can conceive of an alternate world or an alternate evolutionary path with organisms identical to us in otherwise all respects, except that they lack consciousness. This should be a very easy thing to imagine, given that, as Blackmore argues, consciousness itself doesn't really seem to do anything in addition to the various functions we associate with the brain. If theories such as those by Blackmore, Churchland, and Dennett lead us to conclude zombies are possible, then they trigger a very large red flag.

Later in the book, having established (at least in her mind) that much about our conscious experience is illusory, Blackmore proceeds to examine the concept of 'self.' Here, Blackmore's tendency to use such terms as ego, self, soul, and spirit interchangeably, as if they all mean more or less the same thing, will likely frustrate many readers. She explores 'bundle theory,' which may have begun in the West from the work of the philosopher David Hume. Blackmore summarizes Hume's thinking as follows:

> [Hume] described how he stared into his own experiences looking for the experiencing self but all he ever found was the experience. He concluded that the self is not an entity but more like a 'bundle of sensations'; one's life is a series of impressions that seem to belong to one person but are really just tied together by memory and other relationships. (p. 68)

Blackmore then proceeds to strengthen the case that what we mistake for a sense of self is simply a bundle of sensations. She also discusses the teachings of anatta within Buddhism, which is arguably very similar to Hume's argument. In addition, she explores the research of Sperry and Gazzaniga on patients who had the main connection to their brain hemispheres severed. Their findings suggest to Blackmore that our sense of self is likely a construction. "There is neither one self nor two selves inside the split brain; there are experiences but there is no one who is having them—just as it is with you and me" (p. 73).

Blackmore's discussion into the illusory nature of our 'self' is interesting and thought-provoking. But her incomplete treatment of the hard problem (noted above) seems to allow her to move from an illusion about 'self' to an illusion about consciousness itself. In fact, in the book's final chapter, she does indeed embrace the conclusion that consciousness itself is an illusion

(p. 130). But how can her argument be coherent? If Hume is only aware of his experience (but not a self), isn't there is still an event of some kind entailing consciousness? And according to Buddhist teachers and scholars with which I'm familiar, the teaching of anatta (no self) refers to the illusory nature of a constructed ego or self, not consciousness itself (Thurman 2005, Praetorius on behalf of Adyashanti 2016). Further, Buddhist teachings are not inconsistent with the notion that consciousness is fundamental in some sense; not my consciousness or self, but a deeper, more foundational domain of consciousness. And according to Keown (2004), the Buddha condemned the view that there is no rebirth or the fruition of karma or that experience is fully annihilated at death.

Blackmore also considers the question of free will. In the context of what has come before, she understandably is predisposed to consider free will an illusion. She examines Libet's experiments that show neural activity precedes the conscious decision to act, and considers this as evidence supporting that claim. However, Blackmore does acknowledge the complexities and diverse arguments of this long-running debate, including Libet's own view that free will operates through an ability to veto a particular action. I would submit that Blackmore's omission of a careful treatment of the hard problem leaves open an escape clause in her argument that free will is an illusion. That is, if consciousness is fundamental in some sense, it follows that we cannot rely on third person, objective methods of investigation; first person, phenomenological approaches are required also. And this implies that our direct experience of having free will cannot be so easily dismissed.

At various points in the book, Blackmore also considers some paranormal phenomena, and these include out-of-body experiences, near-death experiences, mediumship, and table tipping. Blackmore maintains that all such anomalous phenomena can be explained using conventional theories. Unfortunately, she provides no space for a look at the experimental psi data accumulated in laboratories. Now in fairness to Blackmore, few mainstream books on consciousness include anything like a fair survey of the psi literature either (and of course, Blackmore is a well-known psi skeptic.) Nevertheless, we can note that meta-analyses for a number of psi categories, such as telepathy and precognition, do yield highly significant (though modest) effects. Whether this supports a view that consciousness is in some sense fundamental or not can be debated. Barušs and Mossbridge (2017) provide a rich survey of the extant evidence in parapsychology and explore the implications for theories of consciousness.

As I've discussed, Blackmore never substantially explores the possibility that consciousness might be fundamental. She does briefly

discuss such alternatives as dualism and idealism, but quickly dismisses them. But many who today are exploring approaches that take the hard problem seriously are influenced by Bertrand Russell's (1927) argument on the intrinsic aspect of matter. (This view is commonly called Russellian monism. See Alter and Nagasawa (2012) for a good overview.) Russell's argument has two parts. First, scientific understanding gives us theories that describe the world in terms of structural relationships. But science is silent on the intrinsic aspect of the world. In other words, third-person methods lead us to acquire elegant mathematical equations, but these equations tell us how matter behaves, not what matter truly is. What might the intrinsic aspect of matter be? The second part of Russell's argument claims that the only truly intrinsic element that we are directly acquainted with, without the aid of abstract theories or equations, is what he terms 'percepts.' These would be the raw feels of our perceptions, what today we usually call qualia. Thus, Russell argues that the intrinsic aspect of our world likely possesses phenomenal properties. The most common application of this argument is panpsychism; all particles of matter contain some (arguably rudimentary) level of consciousness. Some find panpsychism implausible, but Russellian monism can take other directions that lead to such approaches as neutral monism, where matter and mind are two aspects of a neutral, foundational reality. In any case, within our current context, Russellian monism suggests a way to think about consciousness in our physical world while avoiding such problems as how fundamentally different substances interact (dualism) or by denying our conscious experiences (illusionism).

Overall, Blackmore's book has some strengths, such as her concise presentations of various neurobiological and cognitive science studies. And readers may well value her thought-provoking discussions on how various cognitive functions can yield to us misleading perceptions of our world. Of course, as I have argued, making the leap that we are mistaken about our conscious experiences (as being characterized as inherently subjective) is a bridge too far. In fact, I admit that I find it disappointing that readers, new to the literature or expecting to learn something exciting or interesting about consciousness, will be encouraged to dismiss their conscious experience as something inherently unreal. I believe a better introduction would have put a delusionist theory in context within the field and not given so much weight to what might be charitably characterized as a rather paradoxical minority position.

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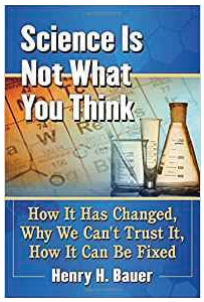
BOOK REVIEW

Science Is Not What You Think: How It Has Changed, Why We Can't Trust It, How It Can Be Fixed by Henry H. Bauer. Jefferson, NC: McFarland & Company, 2017. 260 pp. $35 (hardcover), $18.99 (ebook). ISBN 13: 978-1-4766-6910-6

DOI: https://doi.org/10.31275/2018.1298

The author of the book under review, Henry Bauer, can look back on two long scientific careers. Born in Vienna in 1931, he emigrated with his family in 1939 to Australia, after the annexation of Austria into the German Third Reich. There, he studied chemistry and taught at the University of Sydney. During the 1970s, he applied himself to science studies and began to teach history of science, sociology of science, and philosophy of science. This happened not least because of his then-beginning occupation with issues of anomalistics—when he was confronted with the unscientific manner with which academic science dealt with such research efforts. In 1982, he became a founding member of the Society for Scientific Exploration. These two careers provided him an internal point of view, as a scientist in research and academic teaching, as well as an external one, as a professor of science studies at the Virginia Polytechnic Institute & State University. Thus, he is well-qualified to write a book about what science is.

His book *Science Is Not What You Think: How It Has Changed, Why We Can't Trust It, How It Can Be Fixed,* published last year, presents a kind of summary of his insights gained in the context of science studies. Its title well-describes the contents, and the author systematically handles the material, providing many empirical examples. After describing the development and changes in the 'world of modern science,' he presents a comprehensive critical analysis of the status quo characterized by serious malfunctions and deficits. Thereby, he contrasts its ideal and public image with the seriously differing reality of scientific practice. Finally, he suggests a solution to the most obvious and biggest problems: the installation of a 'Science Court,' independent and free from conflicts of interests, would assess scientific controversies after a thorough examination, following an ideological neutral attitude. Bauer does not present this concept as his own invention—the first approaches go back as far as 50 years, with a vague and not very specific future vision, whose implementation other people have not bothered with, but which he makes practical suggestions for.



His analysis of the current state of science includes all relevant aspects: 1) the increasing economization and politicization of science which diverged from the ideal of a search for knowledge, with insights from protagonists in research fields characterized by sportsmanlike behavior, to a career choice dominated by economic pressure and conflicts of interests; 2) the differing scientific cultures of the natural sciences and the social sciences/humanities as well as the important but often-neglected distinction between facts and theories; 3) issues of research funding, career-building, publication policy, statistics and their so often insufficiently reflected application and interpretation; 4) the public misconception of what science is, and what it is able to do, and, finally, 5) how it deals with 'deviating' scientific positions concerning for example issues from the area of anomalistics research.

This is not the place to give a detailed overview of the individual chapters—the chapter headings and subheadings are explicit in this regard, and, furthermore, the author provides a synopsis of the content (pp. 7–11) in his Introduction. In addition, one can find a listing of the most significant insights in Chapter 11. However, I cannot resist reporting at least a selection of some of his important points (pp. 189–190):

> Scientific knowledge is never guaranteed to be absolute truth.
>
> Science is a human activity. It is as competent and also as fallible as the human beings who do science. (. . .)
>
> Science is not done by the scientific method. Neither that method nor anything else makes research objective, value-free, or unbiased. (. . .)
>
> Luck, good and bad, plays a big part in every aspect of science. (. . .)
>
> The acclaimed successes of science can be largely credited to the fact that the natural sciences have studied predominantly phenomena whose characteristics are reproducible. That obtains only with not-too-complex systems of inanimate objects. Therefore, medical science and the social and behavioral sciences, since they deal with animate subjects and complex systems, cannot attain universal laws the way the natural sciences can. In place of definitive, true-or-false knowledge, the social and behavioral sciences and the medical sciences have to make do with probabilistic understanding and an irreducible degree of uncertainty.
>
> What religion is for some people, science is for others: the ultimate source of certainty. (. . .)

This easy-to-read book is of the type where I can hardly stop making notes. Thus, in my copy, in some places every second sentence is underlined in order to be quickly retrieved for example for quotation. There is

much information presented in a clear and reasonable manner. The huge experience of a long life as a scientist is perceptible in the text, and every conclusion is underpinned with illustrative and plausible examples. This provides astonishing insights into the history of science, which is rich in errors and odd developments.

It is obvious that Bauer himself makes scientific statements that are not completely neutral and unaffected by his own individual research history and agenda. Many of his examples are from the fields of chemistry, pharmaceutical research, and modern medicine, in which fields he has published some critical papers. Further topics, of concern to him for quite some time, are the theories on the causes of global warming (the main cause: human-made CO_2 emission) and AIDS (cause: HIV) that are advocated by mainstream science. He challenges these theories because there is no conclusive evidence in both cases. Furthermore, there are sound counterarguments that are not considered for various (non-scientific) reasons. This is quite interesting, but Bauer—and this is, in my opinion, the only negative aspect of the book—dwells on these two examples a bit excessively and comes up with them again and again in different contexts. He does it not inappropriately but it becomes a bit tiring. However, this is only a small limitation that in no way diminishes the merits of the book. Bauer has enough other examples on hand that are astonishing and thought-stimulating. There is something special about one of them: the theory of gravity waves as a theory that is generally accepted but for which "there are no accepted facts and no proven method of detection." The first

> reported observation in 2014 (. . .) was almost immediately recognized as flawed. It remains to be seen whether the more recent reported detection of gravity waves from two pairs of colliding black holes will become or remain accepted. (p. 112)

Last year, the leading scientists in this field of research, Rainer Weiss, Barry Barish, and Kip Thorne, were awarded the Nobel Prize for physics. Here we are confronted with an unusually short period of time between the obtaining of the first seemingly secure data basis and appreciation of the research with the most renowned science award, which indeed indicates an official acceptance of the data and especially the theory.

This book should become basic reading for every person interested in science, and certainly for students and active scientists. Bauer touches on anomalistics rather marginally, but the volume would not have been written without his interest and involvement in this field of research. Many problems and shortcomings in science can be more easily identified when viewed from a position in the 'border areas,' giving an outside perspective on the centers of activity.

—Gerhard Mayer

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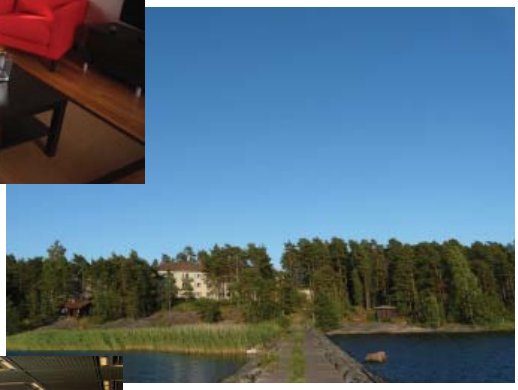

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