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ESSAY

The Unbearable Fear of Psi: On Scientific Suppression in the 21st Century

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Abstract—This paper describes various examples of blatant attempts to suppress and censor parapsychology research and those who are doing it. The examples include raising false accusations, barring access to journals, suppressing papers and data, and ostracizing and persecuting scientists interested in the topic. The intensity of fear and vituperation caused by parapsychology research is disproportionate even to the possibility that the psi hypothesis could be completely wrong, so I speculate on the psychological reasons that may give rise to it. There are very few circumstances in which censorship might be appropriate, and the actions by parapsychology censors put them at odds not only with the history of science but with the history of modern liberal societies. Appendix 1 is an Editorial censored by the then-editors of the Journal *Frontiers in Human Neuroscience.*

. . . the sole end for which mankind are warranted, individually or collectively, in interfering with the liberty of action of any of their number, is self-protection . . . to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant. He cannot rightfully be compelled to do or forbear because it will be better for him to do so, because it will make him happier, because, in the opinions of others, to do so would be wise, or even right. —John Stuart Mill, *On Liberty* (1869/2010:10)

One can only pray, even if in a secular prayer, that as the great scientist and philosopher Giordano Bruno had his tongue and palate pierced by an iron gag before being burned alive in 1600 by the inquisitors for daring to speak his mind, he could sense the "every human love" in the midst of the "pedantic boring cry" of his executioners, as W. H. Auden would wish us all in his 1937 poem *Lullaby*. In some countries (and the *extraordinary rendition* program instigated by the USA and in which 54 other countries colluded to extrajudicially abduct and sometimes torture detainees suggest how few, cf. Fisher 2013), blissfully, the instruments of torture have rusted and are now only curiosities in morbid museum collections. But the itch

to silence those whose opinions we disagree with, applied centuries ago against scientists of the stature of Bruno, Galileo, and others, has spread, ironically, to scientists themselves, and there are few cases as blatant as those involving the topic of parapsychology. In this paper I will discuss how most cases of scientific censorship ultimately betray a profound distrust of the scientific process, cover briefly a few noticeable cases going into detail about one, and append an Editorial censored by two editors of *Frontiers in Human Neuroscience* (see Appendix 1).

To Censor or Not to Censor?

I will not cover in this paper the various ways in which showing an interest in parapsychology is hazardous to one's professional health, including the almost nonexistent funding opportunities, the hurdles in getting an academic job or, having obtained it, in advancing, or the constant swaying to avoid the constant, and most often uninformed and groundless, barrage of critical darts. There are already general discussions on the intellectual suppression of identified groups and alternative positions by those with power and a vested interest (e.g., Martin, Baker, Manwell, & Pugh 1986), including the specific case of parapsychology (e.g., Hess 1992, McClenon 1984). My aim here is much more modest, to cite some recent examples of attempts to suppress parapsychology and to discuss how these attempts betray the honor of the entity they outwardly seem to want to guard: science. But let me start with the necessary question of whether censoring or suppressing scientific discourse is ever justifiable.

The answer for me is an unequivocal "yes," but it comes with a very strong caveat. There are only two circumstances under which I would endorse censorship. The first one is when scientific knowledge of, say, how to weaponize a virus (cf. Saey 2012) or easily build a weapon of mass destruction could (and most certainly would) be used by those wanting to destroy others. I do not trust governments either with this power, but would not want to multiply the problem by making the capacity to inflict enormous damage as accessible as an Internet connection. In this case, the risks would greatly outweigh the benefits of open knowledge. This argument is just a reiteration of the quotation at the beginning of the paper by that great champion of liberty John Stuart Mill.

The other circumstance I can think of would be when a communication incites others to violence and provides specific information that would likely culminate in someone being injured or worse, as was done in Rwanda in 1994 with radio calls to massacre the Tutsi minority and moderate Hutu. This is not a type of communication that we likely would run across in a scientific publication, but there are exceptions such as the rhetoric by Nazi

eugenicists and doctors to "cleanse" the German body of the "vermin" of Jews, the mentally disabled, and other groups they detested (Lifton 1986).

How does parapsychology fare with respect to these two proposed criteria? With respect to the first, leaving aside fictional movies and books of extraordinary and even deadly psychokinetic powers such as *Scanners* by David Cronenberg or, more gently, *Matilda* by Roald Dahl, there is no evidence that the knowledge we have about psi phenomena would allow anyone to develop nefarious or even deadly powers (but see Braude 2008, who considers that possibility as a trigger for the fear of psi). Psi phenomena were investigated secretly by the US and the USSR governments for bellicose ends (May, Rubel, & Auerbach 2014), but they evidently could not be harnessed in this way (otherwise, I am quite sure, we would have already had some evidence such as political or military leaders of an antagonist country suddenly having their heads explode or their hearts stop without any apparent reason). There is research evidence for a *small* direct effect of intention on living beings (Schmidt 2015), which of course could travel on the wings of nasty intentions (see Dossey 1997), but nothing to make any non-paranoiac lose sleep.

A quaint version of the idea that publishing parapsychology might bring about terrible events is exemplified by the bombastic opinion of cognitive scientist Douglas Hofstadter, who wrote that a peer-reviewed set of studies finding support for precognition (Bem 2011) would have implications that "would necessarily send all of science as we know it crashing to the ground . . . [and] spell the end of science as we know it" (http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/a-cutoff-for-craziness). He also remarked that psi phenomena would go against the "laws of physics" despite not being a physicist, and called parapsychology researchers "crackpots" (the itch to insult may be even more peremptory than that to censor). In contrast, actual physicists including University of London cosmologist Bernard Carr and Lawrence Livermore Lab physicist Henry Stapp have developed models that accommodate psi phenomena within physics, with neither of them claiming that if their proposals are right science will "go crashing in flames" (cf. Kelly, Crabtree, & Marshall 2015). In their support of research on parapsychology, they have followed physicists of the stature of Bohm, Bohr, Einstein, Planck, and Pauli, who either proposed physics models of psi phenomena or were at the very least open to its scientific inquiry.

Not as apocalyptic in their rhetoric, but reminiscent of the deadly extraterrestrial parasite in the film *Alien*, Torbjörn Lundh of the Swedish Chalmers Institute organized a symposium with the title of "Pseudoscience: An innocent game or a serious parasite" (http://www.chalmers.se/insidan/

SV/om-chalmers/moten/fakultetsradet/fakultetesradets) in which Magnus Fontes "debated" a study on telepathy we conducted in Lund (Marcusson-Clavertz & Cardeña 2011) without even informing, much less actually debating, the authors of the paper.

Hofstadter also called to censor outright any study finding support for psi because "you believe deeply in science and this deep belief implies that the article [finding evidence for psi] is necessarily, certainly, undoubtedly wrong." Along similar lines, David Helfland, an astrophysicist who also commented on the Bem paper, wrote that publishing research on psi "should be seen for what it is: an assault on science and rationality," and that "A peer-reviewed article must contain sufficient information for another scientist to replicate the experiments. The ESP study fails this test" (http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/esp-and-the-assault-on-rationality). Helfland himself seems not to have any precognitive abilities since a meta-analysis of 90 replications of that study has been conducted (Bem, Tressoldi, Rabeyron, & Duggan 2014). Although not all the replications have been successful, as a whole they have supported the original study. Unfortunately but unsurprisingly (see below), some journal editors have summarily declined to publish it, although it is currently under review.

Let me discuss now some of the implications of the attitude by Helfland and Hofstadter, shared by a number of opponents of parapsychology. First, they seem to assume that science implies a particular metaphysical belief, rather than a method to reduce personal biases, account for likely alternative explanations, and systematically test hypotheses. It might shock them to know that one of the main founders of the scientific method, Francis Bacon, took precognition as a given (1620/1960), and that many Nobel prize-winners and other eminent scientists have held a very different metaphysical view than the current *en vogue* materialist reductionism. And for all of the added knowledge science has brought, throughout history various philosophers have questioned whether we can have an ultimate and definitive knowledge of nature. For instance, one of the most influential philosophers of science, Karl Popper, proposed that science cannot assert something with ultimate authority but advance a model and evaluate whether it can (at that point) be refuted by the evidence proffered (Popper 1963). Helfand and Hofstadter claim a certainty about the nature and interpretation of the "laws of physics" that physicists themselves argue about. From cosmology to quantum mechanics (Gleiser 2014), not to mention the question of how consciousness relates to a putative external reality (Kelly, Crabtree, & Marshall 2015), there are intrinsic limitations to how much we can know given our epistemological limits and the nature of nature. Probably the most

we can say is that models of reality are just descriptions of regularities based on specific ways of measurement (d'Espagnat 2006).

For the sake of argument, let me at this point grant momentarily to the censors of psi their assumption that they are completely and eternally right, and that all people claiming and finding support for psi phenomena are "crackpots," crazies who lack rationality, even though more than 25 of them have received Nobel prizes, in addition to other equally eminent supporters in philosophy and other disciplines both in the past and in the present (Cardeña 2014a). What would be then the danger of not censoring research on psi? If the critics are right, sooner or later parapsychologists will be shown to have been deluded, idiotic, or part of a nefarious conspiracy whose ultimate goal would seem to be to damage their own professional careers. Would analyzing their results, or even conducting research to ultimately show their misguided ways dry the funding of Hofstadter, Helfand, and company? No, the vast majority of funding agencies will not even consider psi research in their remit (Hess 1992). Would publishing psi research drive Professors Helfand and Hofstadter out of their cushy academic positions? Again, no, no one in the field even remotely believes that they will be taken by the psi mob to be guillotined. Rather the opposite, since the anti-parapsychology "skeptics" (not actually skeptics who question other and their opinions, but who follow their beliefs dogmatically, see Cardeña 2011) have been very active and have, for instance, gained the upper hand at editing wikipedia entries and restricting access to TED.com (Technology, Entertainment, Design) to fully conform to their beliefs (see below). Or would a belief in the validity of psi drive crowds of graduate students into academic suicide? Not so either, since the majority of students who have gotten their advanced degrees from, say, the Koestler Parapsychology Unit, have continued to further academic work, despite the additional hurdles they might have had to endure (Carr 2008). Furthermore, at least one of them became a well-known critic of parapsychology (Richard Wiseman), showing that an education with a concentration on parapsychology allows alternative perspectives. And as I momentarily conceded, since psi phenomena will be shown to be completely false, neither science "as we know it" nor the universe will come crashing down.

So here we come to a crucial point. The problem with the parapsychology censors is not that they believe too much in science, but that they do not believe in it enough. As another commentator to the Bem study, Stanley W. Timble, pointed out, that the way science should work is through critical but "open inquiry . . . [and] Disapproval of an idea does not disprove it" (http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/how-open-inquiry-works). Bill McKelvey

also mentioned one of the virtues of science, "A self correcting process" (http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic/how-open-inquiry-works), although one in which valid ideas may be excoriated before being accepted as a new discovery.

As for the second circumstance I mentioned in which I would justify censorship, I have not found a single parapsychology article inciting others to engage in violence, although of course dogmatism and nastiness are probably as prevalent among parapsychology researchers as among other groups (cf. Cardeña 2011). If anything, it is parapsychology researchers who have suffered censorship and unjustified persecution. For instance, the editor of the AAAS journal *Science* in 1975, Philip Abelson, and the AAAS executive officer, William Carey, gave Theodore Rockwell the runaround during a few years when the latter inquired about publishing psi research in the journal (McClennon 1984). Getting more personal, physicist John Wheeler falsely stated in a 1979 AAAS meeting that parapsychology researcher J. B. Rhine had committed fraud as a postdoctoral assistant, although he was later forced by the latter to publish a fairly veiled retraction (see Cardeña 2014b).

Some Recent Examples of Censorship

The itch to suppress parapsychology work was very present at the end of the 20th Century and remains unabated in the 21st Century. Here are some brief examples followed by a longer discussion of one case.

1) A National Research Council (NRC) report on parapsychology (Druckman & Swets 1988) published a damning conclusion about it, ignoring or suppressing favorable reviews commissioned by the Council, including those by Harvard professor Robert Rosenthal and University of California professor Jessica Utts (Palmer, Honorton, & Utts 1989). The NRC report had an important negative effect on funding for psi research.

2) In 1993, after Lawrence Livermore lab physicist Henry Stapp had a paper accepted in which he discussed a successful parapsychology experiment he had carried out, he was asked by the Acting Editor of *Physical Review* to delete all data from his paper. Benjamin Bederson, Sr., Editor-in-Chief of the Journal, also chastised Dr. Stapp for even having sent his paper (Kaiser 2011).

3) Brian Josephson, Nobel prize-winner in physics, had his invitation by physicists Antony Valentini and Michael Towler to a conference on the work of David Bohm rescinded for a while when they found out about his positive attitude toward parapsychology (Reisz 2010). Ironically, Bohm himself had discussed how his model of reality could be integrated with psi phenomena (Bohm 1986).

4) A paper describing empirical support for precognition by eminent psychologist Daryl Bem (2011), published by a top-notch journal after the usual peer-review process, was immediately attacked on the Opinion page of *The New York Times* by some contributors. They asked psi publications to be suppressed, as I described above (http://www.nytimes.com/roomfordebate/2011/01/06/the-esp-study-when-science-goes-psychic).

5) This is an example of individuals who, lacking themselves the power to censor, nonetheless seek to pressure those who have that authority. The Lund University employee magazine *LUM* published an article in 2012 on one of my peer-reviewed research studies in which we obtained three moderate-to-strong significant correlations between our measure of psi phenomena and 3 other variables (Marcusson-Clavertz & Cardeña 2011). Almost immediately a group of 9 Lund University faculty, most of them in the hard sciences (Bertil Halle, Germund Hesslow, Gunnar Karlström, Sven Lidin, Georg Lindgren, Christer Löfstedt, Dan-Eric Nilsson, Olov Sterner, and Bengt E. Y. Svensson) but none of them, to the best of my knowledge, having ever published a peer-reviewed paper (either for or against) on parapsychology research, wrote a letter to the media. In it, they stated that "paranormal phenomena are a chimera," misrepresented the goals of our study, contrasted rationality, reasoning, and integrity with our research, and made a not-so-veiled threat in their mention that a researcher in Lund who had made a mistake had to leave his/her post (http://www.svd.se/pseudovetenskap-sprids-okritiskt). Mattias Collin, another Lund faculty member who has not done any work in psi either as far as I can tell, later added his voice, showing that he had absolutely no idea either of the experimental controls of the original article's research or the topic area by criticizing, among other things, our recruitment of participants who believe in psi phenomena (http://www.sydsvenskan.se/lund/forskare-rasar-mot-kollega/). Fortunately, the Editor of *LUM* (Maria Lindh; http://www.sydsvenskan.se/lund/forskare-rasar-mot-kollega/), then Chair of the Department of Psychology (Per Johnsson; http://www.sydsvenskan.se/kultur--nojen/ett-decennium-i-vetenskapens-gransland/), the College Dean (Ann-Katrin Bäcklund; http://sverigesradio.se/sida/artikel.aspx?programid=1637&artikel=5330277), and then-President (Per Eriksson; http://www.svd.se/vi-studerar-tomtar-och-troll-ocksa) did not take the bait, and all publicly supported our work and our right to publicize it.

6) In 2013, an anonymous (one should always suspect mischief when someone hides behind a curtain) TED science board deleted a talk by psi-proponent Rupert Sheldrake given at the TEDx Whitechapel, and relegated it to a much less frequented TED blog (http://www.tricycle.com/blog/ban-rupert-sheldrakes-ted-talk). One of the apparent proponents of the ban, Jerry

Coyne, also tried to have Sheldrake disinvited to an address he was scheduled to give and wrote favorably about a "Guerrila [sic] Skeptics on Wikipedia (GSoW)" group who "police" wikipedia to delete any positive mention of psi and "pseudoscience" (http://www.newrepublic.com/article/115533/rupert-sheldrake-fools-bbc-deepak-chopra). By the way, the webpage for GSoW only provides 3 full names for their 13 contributors, none of whom seem to have advanced degrees or peer-reviewed publications according to the information on their webpages.

A Case Study

First Act. This is a case I followed closely both as an editor and an author affected by censorship. It all started with an invitation by *Frontiers in Human Neuroscience* (*FHN*) to propose a special topic for the Journal. Enrico Facco, Christian Agrillo, and I proposed the subject of *Non-ordinary Mental Expressions* (NOME), which we defined as

> experiences and procedures that seek to change short- or long-term psychological processes. . . . We aim to reappraise the importance of NOME and its implications for the mind–brain–world relationship. . . . The editors will solicit original research contributions as well as theoretical papers, such as reviews, mini-reviews, and theoretical discussions,

and mentioned that we would invite not only neuroscientists, psychologists, and psychiatrists, but also philosophers, anthropologists, and other professionals (http://journal.frontiersin.org/researchtopic/1666/non-ordinary-mental-expressions). Thus, the topic *FHN* accepted included different types of papers from diverse disciplines discoursing on NOME and their implications for mind–brain relations.

As special topic editors, we had been, without a problem, accepting or rejecting proposals, sending submissions to reviewers, accepting some papers and rejecting others, and were at the stage of processing other submissions after authors had sent their abstracts months earlier. Then John J. Foxe became one of the *FHN* Chief Editors and the problems started. We suddenly heard from him, from the other Chief-Editor, Hauke R. Heekeren, and from *FHN*'s office, about four different papers:

1) The "Editorial Office" of *FHN* wrote that a paper that had been reviewed and accepted by two reviewers and a Topic Editor "does not comply to [sic] general ethical standards . . . this manuscript cannot be accepted for publication." They mentioned that a manuscript with the same name had been submitted and rejected before the NOME call for papers. We replied, to no avail, that the paper that had been rejected before our call had

a different authorship and content than the one that had been accepted by the two reviewers and the topic editor.

Three other papers were rejected by the Chief Editors even before the review process had been completed:

2) A paper on out-of-body experiences was rejected by the Chief Editors because "the findings and interpretations forwarded in this manuscript are flawed and they cannot be relied upon as the basis for future work. The authors have not adequately discussed biologically plausible mechanisms for the effects they report. The interpretation of the effects violates simple principles of parsimony and indeed, the basic laws of physics as they are currently understood." It bears mentioning that neither of the Editors' final degree is in physics and that they did not provide any explanation as to why the paper's proposed findings and interpretations were flawed.

3) A paper on near-death-experiences (NDE) and cardiac arrest was rejected by Dr. Foxe because

> The quality of the article is substandard and below the generally accepted standards of the community . . . . Your paper is not within the scope of our journal which is a venue for work reporting data regarding neural function, which this is clearly not.

The accepted call for NOME stipulated that theoretical discussions on mind–brain relations were within its purview, and it would be difficult to come up with a topic that more clearly challenges a reductionist–materialist account of mind–brain interactions than the complex mental experiences of NDE, apparently occurring during the physiologically impaired condition of cardiac arrest.

4) Finally, a hermeneutical analysis of mysticism was rejected by Dr. Foxe who wrote that "I am taking over the editorial process on this paper at this juncture because it is clear to me, as it should have been to you, that this paper has no place in a journal such as ours." Prima-faciae, however, the topic of the paper was within the remit of the call for papers accepted by *FHN*.

Lucia Brandi, manager of *FHN*, also wrote to us that *Frontiers* had "encountered a number of anomalies related to some of the manuscripts. . . . Some of the manuscripts were found to have received very light reviews," but did not specify what the anomalies were or which papers had been given light reviews. This is particularly ironic considering that the Chief Editors edited a paper by D. Samuel Schwarzkopf (one as reviewer, one as editor) and accepted within a week of submission (see http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4034337/), that criticized a paper in support of psi findings published under the NOME call. In contrast, we did not come even

close to accepting any paper within a week of submission. A couple of short opinion papers were accepted about a month after their submission, and data-driven papers took months before being accepted.

Enrico Facco and I wrote complaining that the fact that *Frontiers* had suspended publication of one paper and review of three others violated its own arbitration guidelines, which stipulated that

> Should a dispute arise that threatens to reject an article, the author may trigger arbitration. In the first place, the associate editor will arbitrate and involve all review editors in a discussion aimed at resolving the dispute. If a resolution cannot be agreed upon, the specialty chief editor is alerted and can opt to bring in additional review and associate editors for consultation . . .

The arbitration process was not initiated by *FHN* despite our request nor did they provide any specifics as to how papers had "anomalies" or had received "very light reviews." We also commented that the Chief Editors had had access to the abstracts of the censored papers for months and should have intervened, if at all, before having the authors waste their time working on a paper they would later reject.

FHN Editorial Director Costanza Zucca, who left the journal shortly afterward, replied to us after a number of prompts, the final one involving a lawyer, that

> I truly regret that you found the tone of the communication by our editorial staff offensive or inappropriate, and I apologise for any offence, which I assure you was unintended; the intention of our staff was to remain respectful and professional in communicating with you . . . we will certainly review these procedures to avoid any further misunderstandings in the future.

Nonetheless, an arbitration process was never carried out, the originally accepted paper was censored, and the review process of the other three was suspended.

Second Act. Despite the censorship just mentioned, we were able to publish 13 papers (which had received more than 140,000 views on August 13, 2015), and I requested that *Frontiers* produce an e-book, as advertised in their special topics information. Dr. Zucca's successor, Fred Fenter, gave the green light, and I was told that I should write an Editorial presenting the collection of articles.

After I submitted the Editorial (published in the second part of this paper as Appendix 1), Dr. Heekeren asked us to add some references to a statement and to make two other changes. I added the references, but the second change requested showed that he had not even looked at the sets of

papers since he mistook the initial paper ("A call for an informed . . . ") with the general call for papers for the NOME topic. He also asked for a revision of our sentence on a paper about psi research:

> The paper produced various responses and counter-responses, some of them illuminating, others, like claiming that "extraordinary claims require extraordinary evidence," being unhelpful clichés (see Franklin, Baumgart, and Schooler 2014, for some valuable suggestions). What I would deem acceptable is to change it to "Notably, the paper produced various responses and counter-responses" and then give references to these different reactions, in the spirit of Frontiers' call for openness and transparency. [emphasis added]

We deleted the sentence, but that was not enough. He demanded that the paper by Dr. Schwartzkopf that he and his Chief Editor had edited or reviewed within one week be referenced:

> It will be important to qualify this statement by indicating that there is deep skepticism about this work. Please cite the commentary by Schwartzkopf in doing so http://journal.frontiersin.org/Journal/10.3389/fnhum.2014.00332/full.

We made the change and referred to the main points made in the paper by Schwartzkopf, along with the response by the authors of the criticized paper, which they had posted on arxiv.org. We did not take any side on that debate but asked the reader to become informed on the issues for him/herself. Dr. Heekeren, however, did not want anything to be added other than the criticism he and his Chief Editor had helped publish and wanted the replies to the Schwarzkopf paper out, writing that "Your revision would turn at least the final part of your piece into a commentary/opinion paper, which is not acceptable for an editorial according to our policy."

At this impasse I contacted Dr. Fenter since it was obvious that Dr. Heekeren would only accept a gerrymandered Editorial that toed his ideological line. Dr. Fenter (with whom we had no problem) wrote back that "The Editors-in-Chief of the Journal have expressed their clear opposition to the publication of the Editorial in any of its edited versions" and he proceeded to publish the e-book without the Editorial. I think that the actions and words of Drs. Foxe and Heekeren speak more clearly than any additional comment I could make about them, but this time around the censors will not have a complete victory since the *JSE* has generously agreed to publish the original Editorial (with minute wordsmithing in a few phrases) at the end of this article (see Appendix 1).

Coda

Whence comes the intolerance and vituperation that some authors and editors pour on parapsychology? As Tart (e.g., 1982) has remarked, its level of emotionality hints that this is not merely a matter of lack of knowledge of the field or intellectual disagreement about the evidence. After all, we all read about findings and theories that we likely know nothing or very little about yet intuitively disagree with, but we do not then singly or with our similarly thinking pals write letters to newspapers denouncing the authors and/or try to have them kicked out from their universities, associations, conferences, or whatever. Most likely, we shrug our shoulders and read about something else. This is not what happens with the psi-censors, though. They seek to exile the dissenters from journals or institutions, catastrophizing that unless they do so science or rationality will perish. One part of the explanation, I think, is the replicated finding in parapsychology that people who tend to believe in psi phenomena actually perform significantly better in controlled psi experiments than their counterparts who do not believe in psi (i.e. the "sheep–goat" effect, see Cardeña, Palmer, & Marcusson-Clavertz 2015). Thus, belief in psi is, to an extent, a self-fulfilling prophecy: Those who believe in it are more likely to have valid corroborations than those who do not. The egocentricity of knowledge, which has been likened to a totalitarian system in which one's perspective is easily seen as the only valid, "rational," or "reasonable" explanation (Greenwald 1980) may then make the censors assume that their view is the only reasonable one. The scientific method and process, not to mention the history of science, at its best should ameliorate this entrenched bias.

This might explain why some critics may be more likely to assert that psi phenomena are "hogwash," but it does not explain their vehemence. For that, I think, additional factors must be considered. I think that a contributing factor is that research on parapsychology is seen as so emotionally (and factually) threatening because it suggests that "things are not as they seem," or at least as the censors believe they are. Even while fully committed to their (limited) view of science, the censors must realize every day that they cannot control, predict, or even come close to fully understanding their lives or even topics of research, no matter how hard they may hold to their scientist toehold. As a mechanism of defense to avoid contemplating that void of understanding, they are then likely to try to "defend" their (uncertain) view of reality against any outside contender. If I am correct, the justification for their censorship is thus not that different from that used by inquisitors to defend a faith whose evidence was also challenged by other opinions or everyday events.

As mentioned earlier, Trimble and McKelvey are not afraid of psi research because they trust that science, if pursued openly, will in the end self-correct. The censors, on the other hand, ultimately lack confidence in the scientific process and assume that they should dictate what can and cannot be researched by others. More generally, they distrust freedom of expression. John Stuart Mill wrote that the truest (or best, by other criteria) ideas come from the free competition of ideas in public discourse. This value has been fundamental not only to the development of science but of liberal societies, and has been endorsed by a plethora of thinkers including Voltaire, Thomas Jefferson, Anton Chekhov, Isaiah Berlin, Karl Popper, Paul Feyerabend, Vaclav Havel, and many others. It is thus ironical that some scientists would rather follow the model of the censors of yore than that of the builders of the freedoms they enjoy in their everyday lives. Have they already forgotten that not so long ago they were on the other side of the gags for not accepting a particular metaphysical account?

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APPENDIX 1
Introduction to Non-Ordinary Mental Expressions

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[Unpublished Editorial written as an Introduction to the ebook, *Non-Ordinary Mental Expressions* edited by Etzel Cardeña and Enrico Facco published by *Frontiers in Human Neuroscience* at http://journal.frontiersin.org/researchtopic/1666/non-ordinary-mental-expressions]

The term *non-ordinary mental expressions* (NOME) encompasses unusual or anomalous experiences, and their related neuropsychological processes and induction procedures. Of course what is considered unusual has varied across time and cultures. Our use of non-ordinary does not assume pathology and includes sophisticated and positive mental activities including some forms of creativity, intuition, and spirituality. Foundational figures in

psychology of the stature of William James, Pierre Janet, and Sigmund Freud exemplified how researching NOME was essential to understanding the mind. For instance, James discussed alterations of consciousness as potentially having practical uses and providing alternative epistemological pathways into our understanding of mind and its relation to reality, and he did not consider these phenomena as necessarily odd or pathological (James 1902/1958). That NOME do not necessarily reflect psychosocial or neurological dysfunctional processes has been borne out by research showing that spontaneous and induced NOME can have long-term positive effects (e.g., Cardeña, Lynn, & Krippner 2014, MacLean, Johnson, & Griffiths 2011).

James and like-minded contemporaneous authors would have been dismayed that phenomena so consequential to religion, philosophical thought, social movements, arts, and individual lives (Cardeña & Winkelman 2011) were mostly ignored by academic psychology during much of the 20th Century. Nonetheless, the study of NOME seems to have a current resurgence, partly underpinned by studies of correlated brain dynamics. Something to bear in mind is that although neuroscience studies of NOME may illuminate Aristotelian material and formal causes, they often confuse them with efficient (the proximate source of the experience, e.g., a potentially independent or partly independent set of relations in reality) and final (does the experience serve a purpose, evolutionary or otherwise?) causes. Furthermore, some scientists have proscribed *by definition* areas of NOME research because they grate against their metaphysical positions, without due consideration of the relevant empirical research. Among many examples of this attitude are physicist John Wheeler's attempt to eject the Parapsychological Association from the AAAS while falsely claiming that parapsychologist J. B. Rhine had committed scientific fraud (Cardeña 2014) and cognitive scientist Douglas Hofstadter's plea that the Editors of the *Journal of Personality and Social Psychology* should have just ignored a study supporting the psi hypothesis to "prevent the end of science as we know it" (Hofstadter 2011, see also Cardeña 2011). Therefore, we initiate this e-book with an article co-signed by 100 academics calling for an open, informed study of all aspects of consciousness, including the psi hypothesis (see below), followed by a set of articles centered on procedures that may induce NOME.

A reliable finding in *hypnosis* research is that among individuals responsive to hypnotic suggestions the latter will influence brain activity and the experience reported by participants in accord with the specific verbalizations provided (Oakley and Halligan 2013). That is, however, a different question from whether a mere hypnotic induction (which typically

involves instructions to disregard extraneous concerns and enter a state of hypnosis) produces an experiential and neurological distinct state of consciousness (Cardeña, Jönsson, Terhune, & Marcusson-Clavertz 2013). In their article, Jamieson and Burgess describe EEG indicators of a putative hypnotic state independent of specific suggestions. Their results show that among high but not low hypnotizables a hypnotic induction produced an increase in the theta imaginary component of coherence (iCOH), and a greater decrease in beta1 iCOH. The authors conclude that hypnosis produces a qualitative change in the organization of brain control systems in high hypnotizables. These results should be replicated taking also into consideration group differences within those very responsive to hypnosis (Terhune, Cardeña, & Lindgren 2011).

In a study that employed hypnosis to increase the amount of details recalled, Palmieri et al. conclude that memories of *near-death experiences* (NDE) are similar to those of demonstrably real events in terms of detail, self-referentiality, and emotional information, but dissimilar to those of imagined events such as dreams. Their EEG analyses also revealed that NDE memories were associated with theta and delta bands. The authors conclude that, at a phenomenological level, NDE memories are different from imagined ones and are stored as episodic memories of events experienced in a NOME.

In another study, Charland-Verville et al. compared the characteristics of "NDE-like" experiences not related to a life-threatening event with those associated with pathological coma (anoxic, traumatic, or other), or "real NDE." Overall, the two types of experiences did not differ in NDE features' intensity or content, with a sense of peacefulness being an almost universal aspect (only 1% of participants mentioned a dysphoric experience).

To further elucidate one of the features of NDE, *out-of-body experiences* (OBE), Greyson et al. evaluated the phenomenology of 100 seizure disorder patients, 55% of whom could describe their seizure-related experiences (including dysphoric emotional states, episodes of déjà vu, confusion, flashing lights, hearing music, smells, paresthesias, and headaches). Seven individuals also recalled sporadic OBE along with time distortion, but without other characteristics of NDE such as a sense of revelation, joy, or enhanced cognition. In the last paper on this phenomenon, Bókkon, Mallick, and Tuszynski propose that the experience of a bright light in NDE is caused by an overproduction of free radicals and excited molecules, which may generate transient enhancement of luminiscent biophotons in retinotopic and other areas of the brain. They conclude that these stimuli are then interpreted as originating in the physical world.

Moving to *meditation*, Thomas, Jamieson, and Cohen conducted an

EEG study on intermediate and advanced Satyananda Yoga practitioners. Intermediate meditators showed greater source activity in low frequencies during the non-meditation (mental calculation), and meditation (body-steadiness and mantra) conditions. Advanced meditators showed greater activity in high frequencies in all conditions, particularly during meditation. The authors conclude that inhibition of a right lateralized network comprising visual, somatosensory, and body–world self-representations reflect sensory withdrawal and ego-diminishment. In contrast, conscious states specific to advanced practitioners require both disengagement from self–world representational systems and the development of widespread gamma synchronization.

Xu et al. employed fMRI to compare nondirective and concentrative ACEM meditation to a rest condition in a group of experienced practitioners. The first modality involves a relaxed focus of attention allowing the non-judgmental occurrence of mental events, without the expectation that mind wandering will decrease. The second type of meditation is geared to decreasing mind wandering. Results suggest that nondirective meditation involves more extensive activation of brain areas associated with episodic memories and emotional processing (parahippocampal gyrus and amygdala), than concentrative meditation or regular rest.

In the last paper on factors that may induce NOME, Roseman et al. describe the effects on cortical functional connectivity of the *psychedelic* drug psilocybin and the stimulant/psychedelic hybrid, MDMA. Both substances produced marked subjective effects (e.g., a sense of motion, geometric images, alterations in the sense of time and space), more pronounced in psilocybin. Between-network connectivity was generally increased under psilocybin, implying that networks became less differentiated from each other in the psychedelic state, whereas decreased connectivity occurred between visual and sensorimotor cortical networks.

In their paper, Hinterberg, Zlabinger, and Blaser explore how different mental perspectives or positions (toward the mental self or intrapersonal, toward the mental outer world or extrapersonal, or in empathic connection with someone else's intrapersonal space) and attentional foci (self vs. object) correlate with brainwave activity. They propose that alpha2 and beta2 bands are good indicators of different perspectival viewpoints, whereas delta power differentiates attentional focus on the self from that on objects.

The final section of the book is devoted to evaluating the *psi hypothesis*, namely that individuals may be affected by stimuli spatially or temporally distant, without the apparent mediation of the sensory systems or logical reasoning. Mossbridge, Tressoldi, and Utts discuss a 2012 meta-analysis that supported the hypothesis that human physiology can discriminate between

randomly delivered stimuli occurring 1–10 s in the future, a phenomenon known in the literature as *presentiment.* This article stirred a number of comments and a paper by Schwarzkopf (2014), who had 6 criticisms of the meta-analysis, namely that: 1) some of the studies included were of questionable quality, 2) it should have included studies not conducted by psi researchers, 3) there was an imbalance between the more frequent calm versus the less frequent emotional trials, 4) the results might have been caused by analytical artifacts such as not correcting for baseline, 5) there was an unproven assumption that physiological effects scale linearly with expectation, and 6) the results are not plausible because they would reverse the arrow of time. Mossbridge, Tressoldi, Utts, Ives, Radin, and Jonas (2015) responded to these points in the following ways, that: 1) the original meta-analysis (2012) had already reported that not including the articles questioned by Schwarzkopf did not make a difference to the results reported, 2) the original 2012 paper had also reported that the data sent from non-psi labs confirmed the meta-analytic result, 3) if anything, the imbalance between calm and emotional stimuli would have gone against the meta-analysis, 4) some studies had indeed corrected for baseline through normalization, and for those that had used other baselining methods such design features as randomization and sampling with replacement make it difficult to see how such methods could have affected the results, 5) a simulation conducted by the authors showed that expectation bias could not explain away the results of the meta-analysis, and 6) that a presentiment effect is consistent with time-symmetric processes, which are well-known and accepted in quantum mechanics (see Millar 2015). Many of these points and counter-points are complex and the reader is advised to read the original papers directly.

Testing the psi hypothesis of retrocausal effects, Rabeyron presents a study in which researchers probed whether reaction time could be affected by a picture *after* (not preceded, as is conventionally tested) the target word. This study followed an earlier one in which strong significant effects had been obtained in post hoc analyses (Rabeyron & Watt 2010). In the current paper there were overall nonsignificant results. A post-hoc analysis with the 10 participants who had a retro-priming effect showed that they tended to report previous putative precognitive experiences. The author discusses potential explanations as to why replication supporting the psi hypothesis has been inconsistent. The book ends with the opinion paper by Acunzo, Evrard, and Rabeyron reviewing neuroimaging research on the psi hypothesis. They mention that 5 out of 6 studies were consistent with

the hypothesis but also note methodological shortcomings that should be solved in future research.

After a long hiatus, research on NOME has barely restarted and has a long way to go. Comparisons and integrations across different experiences, induction procedures, and analytical techniques are badly needed. We consider this investigation essential but would not dare to predict where it may lead us. As a leading theoretical physicist has stated: "The very nature of scientific inquiry always ongoing and always under revision necessarily implies the notion of a changing understanding of reality" (Gleiser 2014:271).

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