Why Is There a Skeptical Movement?

by Daniel Loxton, 2013

The ongoing work of the Skeptics Society and Skeptic *magazine is part of an ancient and noble public service tradition. Today, we present two chapter-length explorations of that tradition, digging into the roots, founding principles, and purpose of scientific skepticism.*

Part One: Two Millennia of Paranormal Skepticism

Recently, physicist Daniel W. Hering (Dean of New York University) reflected on a long-standing but often neglected problem:

> Many capable students of real science do not realize the extent to which pseudo-science is propagated today, and the hold it has upon popular attention at the very time that investigators are applying their efforts to realities or to the development of ideas that are founded upon real facts. This is not a new situation; it has often been so in the past, but it may be worth while to point out that it is still so.[1]

That passage comes from the first page of Hering's *Foibles and Fallacies of Science*, a critical survey of classic paranormal and pseudoscientific beliefs from psychic prediction to dowsing to faith healing. It was indeed written "recently"—in relative terms. Published *almost a century ago*, Hering's 1924 book was, even then, only the latest in a very old literature devoted to the debunking of superstitious beliefs and the investigation of weird claims. As Hering alluded in this passage, the need for such paranormal criticism goes back a long way. Attempts to fill that need go back just as far.

What is now called "scientific skepticism"[2] —the practice or project of studying paranormal and pseudoscientific claims through the lens of science and critical scholarship, and then sharing the results with the public—was old when the first skeptical podcasts appeared in 2005.[3] It was old in 1996 when the James Randi Educational Foundation was formed;[4] old in 1992 when Michael Shermer and Pat Linse organized the Skeptics Society[5] and launched *Skeptic* magazine (one of the first skeptical periodicals to appear on newsstands)[6]; and it was already old in 1976 when CSICOP was formed—the first successful, broad-mandate North American skeptical organization of the contemporary period.[7]

Spearheaded by philosopher Paul Kurtz,[8] the founding of CSICOP (the Committee for the Scientific Investigation of Claims of the Paranormal, since renamed CSI, or the Committee for Skeptical Inquiry) is usually considered the birth of the "modern skeptical movement." This is fair, so far as it goes—but it is nowhere near the whole story. The 1976 creation of a banner under which like-minded people could gather and collaborate[9] was to prove a major milestone, providing a model for the skeptical

organizations and media that followed,[10] but CSICOP was nonetheless part of an existing tradition. CSICOP was organized to continue the work that had been pursued previously by independent scholars and activists such as Martin Gardner (whose 1952 book *Fads & Fallacies in the Name of Science*[11] remains influential) escape-artist James Randi (who has offered a public paranormal challenge since 1964)[12] or magician Henry Gordon (a prominent media skeptic from 1960 onward, especially in Canada).[13] CSICOP was, indeed, born from the same impulse that had previously given rise to more narrowly topic-specific, older groups organized along skeptical lines, such as California's health fraud watchdog groups (of the 1970s onward)[14] the Society of American Magicians' Occult Investigation Committee (formed around 1931)[15] or New York City's Metropolitan Psychical Society (established in 1905).[16]

CSICOP was also predated, and in part inspired, by at least one significant European skeptics group: the broad-mandate Belgian organization Le Comité Belge pour l'Investigation Scientifique des Phénomènes Réputés Paranormaux, which you'll recognize as the model for CSICOP's name.[17] Formed in the terrible aftermath of the Second World War,[18] the Belgian group was created partly in response to a pressing consumer protection problem. That problem was a tragedy of its time, and yet hauntingly familiar: a predatory industry of bogus psychics was selling false hope to the grieving relatives of people who had gone missing during the war.[19] In those sad years, there was no shortage of customers—a pattern repeated in other times of conflict. (Harry Houdini and other skeptical activists had earlier battled a massive surge in the industry of psychic con artists in the wake of the First World War. Commenting during the early part of the Korean War,

American skeptical investigator Rose Mackenberg predicted a new surge based on this historical pattern. "To these charlatans, who take a cruel advantage of human grief and anxiety, war brings boom times," she said. "The anguish of friends and relatives of dead, wounded or missing servicemen offers a fertile field for heartless deception."[20])

But scientific skepticism—and the need for such a project—is much older even than the earliest skeptical organizations. So too is the necessity to defend scientific skepticism against complaints that its traditional paranormal subject matter is "trivial" or "played out."[21] Daniel Hering addressed just such complaints a generation before the first Belgian skeptical organization, writing at around the same time Al Capone was taking over Chicago:

> It may be asked, "Why give so much attention to subjects so antiquated as astrology or perpetual motion—subjects long ago abandoned or at any rate now passé?" The question would be more pertinent if either of these or any other of the general topics here considered were actually obsolete or even obsolescent. The excuse for including them lies in the force with which these things once seized and commanded general interest, and in the fact that with very many supposedly intelligent people similar things are little less compelling today than they were in the Dark Ages.[22]

This passage could have been written yesterday. It reminds me of my own 2007 response to similar current complaints that traditional scientific skepticism is no longer relevant: "The job isn't done. It will never be done. The need for this work has not diminished just because we grew sick of doing it."[23]

A Glance Back

Science-informed or critical examinations of paranormal, pseudoscientific, or superstitious claims stretch back *centuries*. In some cases, we can see a clear thread of mutual influence—a tradition or genre of interconnected skeptical literature[24] or even collaborative networks of skeptical activists. In other cases, we see the same debunking impulse given life by multiple independent authors. Either way, it's essential for skeptics to look back over that work, learn from the lessons of the past, and appreciate that we're caretakers for the work of those who have come before.

Let's look at a few older historical examples here in Part One. Then, in Part Two, we'll discuss the birth and founding principles of the contemporary skeptical movement, and make a case for the practice of traditional, science-based skepticism.

But first, some important words of caution. Do note that these examples are just a small sample selected from sources I happen to have on my bookshelf. This is not, by any stretch of the imagination, a comprehensive survey of the historical debunking literature. Nor is this a general history of skeptical thought. My interest here is the roots of *only* scientific skepticism—specifically the study and criticism of factual claims involving the paranormal or fringe science—rather than on wider philosophical doubt.[25] As well, because my topic here is the formative *early* history (and prehistory) of the skeptical movement, I will largely leave aside for another day exploration of the contributions of recent decades (including most of the work of the Skeptics Society, the James Randi Educational Foundation, regional and overseas groups, and such recent developments as podcasting).

Please also note that most of the pre-1976 authors did not think of themselves as part of a "skeptical movement" (although some may have) and that some—especially those prior to the twentieth century—had other concerns that modern skeptics would find unfamiliar.[26] In general, older treatments of "popular errors" blended practical arguments against mistaken factual claims with idiosyncratic philosophical arguments that attacked political or theological views that those authors happened not to share. I'm intentionally setting aside such differences, and instead focussing on a specific thread that these authors share in common, in order to underline a basic but important truth: *we are not the first people to try this stuff.*

A Long-Travelled Road

Although rarely discussed by modern skeptics, the first three quarters of the twentieth century produced a tremendous variety of skeptical media, investigators, and activist campaigns devoted to the critical study of fringe ideas and the exposure of pseudoscientific impostures. In addition to the works we'll consider in this article, a few additional twentieth century examples I have in my *Junior Skeptic* research library include *The Bermuda Triangle Mystery—Solved*, by Larry Kusche (1975); *Cults of Unreason*, by Christopher Evans (1973); *Mediums, Mystics & the Occult* (1975) and *ESP, Seers & Psychics* (1970) by Milbourne Christopher; *UFOs Explained* (1974) and *UFOs Identified* (1968) by Philip J. Klass; *The Medical Messiahs: A Social History of Health Quackery in Twentieth-Century America*, by James Harvey Young (1967); *ESP: A Scientific Evaluation*, by C.E.M. Hansel (1966); *The Nuts Among the Berries*, by Ronald M. Deutsch (1961); *The Natural History of Quackery*, by Eric Jameson (1961); *The Golden Age of Quackery*, by Stewart Holbrook (1959); *Sixty*

Years of Psychical Research, by Joseph Rinn (1950); the investigations and high-profile magazine articles[27] of private eye Rose Mackenberg (active from the 1920s into the 1950s); *The Spoor of Spooks* (1954) and *The Natural History of Nonsense* (1946) by Bergen Evans ; *The Dead Do Not Talk* (1946) and *Spook Crooks!* (1928) by Julien Proskauer; *Hoaxes* by Curtis MacDougall (1941); the decades of law enforcement campaigns against quack healers and fraudulent fortunetellers led by Mary Agnes Sullivan, described in her autobiography *My Double Life: The Story of a New York Policewoman* (1938); the smart-alecky *The Marks of a Clear Mind, or Sorry But You're Wrong About It* by Alfred Edward Wiggam (1930); *Spiritism and Common Sense* by the Jesuit magician Rev. C. M. de Heredia (1922); *Nostrums and Quackery*, from the American Medical Association (1911); *The Evidence for the Supernatural: A Critical Study Made with "Uncommon Sense,"* by Ivor Tuckett (1911) *Studies in Spiritism*, by Amy Eliza Tanner (1910); *Behind the Scenes with the Mediums* by David P. Abbott[28] (1907); *Mediums of the 19th Century*, by Frank Podmore (1902); and *Fact and Fable in Psychology* by Joseph Jastrow (1900).

We'll add and discuss some further examples in a moment. But this partial list above should be enough to underline the warning that population geneticist George R. Price expressed in a 1955 article for the journal *Science*, as he threw a bucket of cold water on ESP research: "There is a literature on the supernatural, just as there is a literature of chemistry and physics, and the scientist who ignores this literature and depends on his pure reasoning powers in evaluating reports of psychic phenomena is at a disadvantage. A little acquaintance with the careful studies of men like Podmore and Houdini will give one a broader point of view and a clearer understanding by which to evaluate modern parapsychology."[29] This rather

spectacular understatement applies as much today as it did in Price's time: if we don't understand the literature, our ability to make useful and responsible contributions is limited.

Let's look at a few examples. Although it has been suggested[30] that the "canon" of skeptical topics arose as a historical accident from the idiosyncratic concerns of the founders of CSICOP in 1976, psychologist Donovan Hilton Rawcliffe's 1952 *The Psychology of the Occult* (re-released as *Illusions and Delusions of the Supernatural and Occult* in 1959) shows that the canon is older. Written a generation before CSICOP, *The Psychology of the Occult* turned a systematically skeptical eye on a full range of familiar paranormal topics, including firewalking, miracle healing, dowsing, telepathy, poltergeist hauntings, psychokinesis, automatic writing, seances, and so forth. Much as Michael Shermer has done in recent decades, Rawcliffe attempted not merely to debunk these claims, but to explain the underlying psychology of why people believe weird things. From the outset, Rawcliffe emphasized that "the incredulity of the psychologist towards psychical research springs, not from an *a priori* judgement that paranormal phenomena are impossible, but from an extensive knowledge of physiological causes of error."[31] For example, he discussed the process through which a given person's anecdotal testimony of a paranormal experience becomes embellished over time:

> Since the point of telling such a story is to be believed, the narrator in his enthusiasm will tend to add embellishments, emphasizing favorable points, omitting unfavorable points. After two or three repetitions these additions and omissions will become part of his memory of the incident; he will be prepared to swear to their truth

> with absolute sincerity. This process, in which the imagination becomes fused with the memory, is known to psychologists as *retrospective falsification*.[32]

A generation in turn before Rawcliffe, psychologist Joseph Jastrow's 1935 survey *Error and Eccentricity in Human Belief*[33] likewise explored the usual suspects of skeptical topics (building upon work he himself had conducted decades earlier[34]), including "fabulous zoology," Ouija boards, demonic possession, then-famous hoaxes, dowsing, psychic "sensitives," palmistry, numerology, and auras. Like Rawcliffe and Shermer, Jastrow sought to explain how belief works—and how thinking goes wrong.[35] As he put it in a 1935 interview, "The story of human error is vital for understanding the progress of knowledge."[36] In the pursuit of this understanding, Jastrow's skeptical books explored the specific mechanisms of belief. When skeptics today discuss concepts like "confirmation bias" and "motivated reasoning," we follow a path that Jastrow walked long ago. "Ignorance accounts for much unwisdom; but even more, the ready acceptance of congenial conclusions," explained Jastrow.[37] He wrote, "The pursuit of truth is affected by the personal equation of one's commitments. In matters of belief, rationalization is a serpent of even more subtle mien and persuasive tongue than in excusing conduct. Arguments and adherents are of a nature all compact."[38]

In the 1920s, magician Harry Houdini made a sustained career of active investigation into spirit mediumship (that is, "talking to the dead," as practiced today by John Edward, Sylvia Browne, and many others). Houdini was hardly the first skeptic to expose fraudulent psychics (indeed, Houdini was closely connected to a regional skeptical activist scene that existed in New York during the early

twentieth century[39] and cited these colleagues in his own work) but Houdini brought the practice of scientific skepticism to a new level of visibility. He also argued, notably, that the slipperiness of paranormal claims required specialist experts. Citing his relentless on-site investigations ("in 1919, I attended over one hundred seances with the sole purpose of honest investigation") and vast archival research ("I have accumulated one of the largest libraries in the world on psychic phenomena, Spiritualism, magic, witchcraft, demonology, evil spirits, etc., some of the material going back as far as 1489"), Houdini emphasized that "Mine has not been an investigation of a few days or weeks or months but one that has extended over thirty years"—which is to say, a career spent toiling in a distinct field of research. As a result of this sustained study, he wrote,

> I claim that in so far as the revelation of trickery is concerned my years of investigation have been more productive than the same period of similar work by any scientist; that my record as a "mystifier of mystifiers" qualifies me to look below the surface of any mystery problem presented to me and that with my eyes trained by thirty years' experience in the realms of mystery and occultism it is not strange that I view these so-called phenomena from a different angle than the ordinary layman or even the expert investigator.[40]

After his sudden death in 1926, Houdini's work busting fraudulent psychics was continued by private detective Rose Mackenberg, who had worked for the magician as an undercover investigator of mediums—an early demonstration of the kind of direct continuity of expertise that modern skeptical organizing makes possible today. Houdini's example also inspired, in 1931, a highly-publicized activist

debunking campaign from the Society of American Magicians, which allied with the New York Police Department's Policewomen's Bureau under the command of detective and skeptic Mary Sullivan to crack down on the psychic industry in New York City.[41]

Yet even these early thinkers built on earlier work. Scientific skepticism's roots twist down through the nineteenth century, entwined with the growing professionalization of science.[42] In 1883, for example, naturalist Henry Lee published two books critiquing what would later come to be called "cryptozoology" (*Sea Monsters Unmasked*, and *Sea Fables Explained).*[43] Other nineteenth century works devoted to the critical study or debunking of extraordinary claims include *Hours with the Ghosts or Nineteenth Century Witchcraft* (1897) by Henry Ridgely Evans[44]; *Cock Lane and Common-Sense* (1894) by Andrew Lang; the University of Pennsylvania's *Preliminary Report of the Seybert Commission for Investigating Modern Spiritualism* (1887); and John Timbs' *Popular Errors Explained and Illustrated* (1856). We'll look at some others below.

Some of the best-known names of nineteenth century science got into the debunking game. Richard Owen, of the British Museum (the man who coined the term "dinosaur") wrote a devastating public critique of sea serpents in 1848, saying, "A larger body of evidence, from eye-witnesses, might be got together in proof of ghosts than of the sea-serpent."[45] Charles Darwin himself went quietly after spirit mediums,[46] providing private encouragement and significant financial backing[47] for the 1876 prosecution of a medium named Henry Slade. Darwin's colleague Thomas Henry Huxley went so far as to attend a number of séances with a variety

of mediums, concluding that "they were, each and all, utter impostors" in his assessment. Huxley even learned to expertly perform the key mediumistic trick of producing "spirit-raps" with a crack of one's toe. He publicly denounced this "shameful trade" as both fraudulent and repellent, expressing disgust at the idea of being "made to talk twaddle by a 'medium' hired at a guinea a séance."[48] (Michael Shermer has called this "one of the great one-liners in the history of skepticism."[49]) Huxley's experiences taught him that the study and exposure of psychic trickery required specialized techniques and specialist skills. "A man may be an excellent naturalist or chemist; and yet make a very poor detective," he wrote, "But, in these investigations, those who know are aware that the qualities of the detective are far more useful than those of the philosopher."[50]

Reverend Amos Craft's 1881 *Epidemic Delusions: Exposé of the Superstitions and Frauds Which Underlie Some Ancient and Modern Delusions* cast a critical gaze over spirit mediums, end of the world panics, bogus religious relics, witch-hunting manias, haunted houses, clairvoyance, and mesmerism. Again and again he hammered home the point that paranormal claims rest upon arguments from ignorance.

> The following formula exhibits the common sophistry of superstition: If it is not———— what is it? We do not know. Therefore, it is————. The name of any favorite…force is inserted in the blank spaces, according to the desire of the individual who consciously or unconsciously employs the formula. Professor Crookes…asks: "If it is not psychic force, what is it?" He answers, "I do not know;" and concludes: "Therefore, it is psychic force." A spiritualist looking upon the same phenomena reasons in

> the same manner; but arrives at a different conclusion: "If it is not a spirit, what is it? I do not know; therefore, it is a spirit." "I do not know," is a hard saying, even for philosophers. They prefer the utterance: "I do not know; therefore, I know."[51]

Craft lectured widely, warning the public that "modern beliefs concerning mesmerism, clairvoyance, and spiritualism have enabled impostors to spring up from the criminal classes which exist in every community, and reap an abundant harvest of fun, frolic, money and sin."[52] He offered extravagant cash challenges for simple demonstrations of genuine clairvoyant ability. None dared accept those challenges, for the "whole matter of mediumship begins and ends in fancy, or fraud and ignorance."[53] Craft emphasized that the tricks of the psychic trade were truly ancient. "There is nothing new to be discovered in the methods of fraud, mankind having studied this black art so long," Craft wrote. "Just as the modern medium will talk in indefinite terms, so that her words can neither be proved true nor false, so the ancient sibyl wrote her oracles on leaves, and scattered them on the wind, so that no certain meaning could be attached to her words."[54]

It's sometimes suggested that best guide to the trickery of scoundrels must be another scoundrel. Crafty entertainment producer P.T. Barnum's 1865 survey of scams and paranormal claims, *Humbugs of the World*, lifted the curtain on ghosts, psychics, quack medicine (his discussion of "the practice of giving a *placebo*—that is, a bread pill or a dose of colored water, to keep the patient's mind easy while imagination helps nature to perfect a cure" is especially fascinating),[55] and a great many schemes from the business world. Barnum positioned himself as something of a skeptical activist, writing, "If any expositions I can make on this subject will

serve to put people on their guard against impositions of all sorts, as well as foolish superstitions, I shall feel a pleasure in reflecting that I have not written in vain."[56] To that end, Barnum offered a spectacular cash reward for a demonstration of psychic powers—a precursor to the James Randi Educational Foundation's "One Million Dollar Paranormal Challenge"[57] (as well as to similarly lavish cash challenges offered later by many others, including Amos Craft, Joseph Rinn, and Harry Houdini[58]). Barnum sealed a series of questions in an envelope, announcing that if any "professed medium will answer those questions pertinently in my presence, and without touching the envelope, I will give to such party five hundred dollars, and think I have got the worth of my money."[59]

Newer skeptics sometimes suppose that skepticism has recently widened its focus to include alternative medicine. As a historical matter, the opposite is true: criticism of questionable and quack medicine is one of the broadest and deepest pillars in the skeptical foundation.[60] In 1842, famed surgeon, writer and inventor[61] Oliver Wendell Holmes Sr. (father of the Supreme Court Justice Oliver Wendell Holmes, Jr.) put current and past systems of alternative medicine into context in his lectures on "Homeopathy and Its Kindred Delusions." He explained that studying the claims of the past sheds light on the claims of the present. As part of that argument, Holmes described what were already the tired old clichés of alternative medicine: "a series of arguments, which have been so long bruised and battered round in the cause of every doctrine or pretension, new, monstrous, or deliriously impossible, that each of them is as odiously familiar to the scientific scholar as the faces of so many old acquaintances, among the less reputable classes, to the officers of police."[62] His science-based critique of homeopathy remains accurate and

relevant (his words could easily have been written by moderns critics such as Simon Singh or Steven Novella). Also painfully familiar is the social landscape he described, in which false medical claims were widely promoted by scam artists and sincere cranks, rejected out of hand (and ignored) by the scientific establishment, and yet embraced by the public—thus creating a public service need for specialized critics who were willing to dig deeply into such claims. And so, speaking in 1842, Holmes found it necessary (as so many have since) to argue that scientific skepticism was something worth doing. It may have been understandable for medical scientists who "would not even look into Homoeopathy" to "lay their heads upon their pillows with a perfectly clear conscience," but this left laypeople to evaluate homeopathic claims on their own, without any of the expertise needed to do so safely. Given that public health need, Holmes begged that "the scholar must not, therefore, smile at the amount of time and labor expended in these Lectures upon this shadowy system"—for, while homeopathy may or may not do harm to a given patient, "it always does very great harm to the community to encourage ignorance, error, or deception in a profession which deals with the life and health of our fellow-creatures."[63]

A year before the Holmes lectures, Charles Mackay published his colossal 1841 skeptical volume, *Extraordinary Popular Delusions and the Madness of Crowds*. Again we see the skeptical canon—miracle cures, fortune-telling, haunted houses—discussed through a thoroughly modern skeptical lens, along with discussion of speculation-fueled market collapses, fad phrases, and other social phenomena. Some of these, such as Dutch tulip mania, may sound remote or alien to modern readers, but astronomer Carl Sagan (the person most closely associated with the

phrase "scientific skepticism") argued that this was all the more reason for modern skeptics to study Mackay's book:

> The value of the book…lies in the remoteness of the frauds and delusions described. Many of the impostures do not have a contemporary ring and only weakly engage our passions: It becomes clear how people in other times were deceived. But after reading many such cases, we begin to wonder what the comparable contemporary versions are. People's feelings are as strong as they always were, and skepticism is probably as unfashionable today as in any other age. Accordingly, there ought to be bamboozles galore in contemporary society. And there are.[64]

A similar volume, *Humbugs of New York*, by David Meredith Reese, appeared three years before Mackay's. Like many other authors, Reese found it necessary to defend the skeptical exercise. He noted that many qualified authorities refuse to get involved with fringe claims, basically on the ground that it's a thankless pain in the ass in which "no benevolence of motive, no spirit of kindness and conciliation of manner, no fairness or candour of reasoning, can protect an antagonist from the anathemas of the clique who have embraced and propagated the humbug."[65] It's a dirty and often apparently pointless job—which, as modern skeptics know, most working scientists prefer to watch from the sidelines.

> It is for this reason that many wise and good men have refrained from throwing themselves into the breach, under such circumstances; though they have fully realized, and deeply deplored, the folly and infatuation which is raging around them. Not that they are deficient in moral courage for the work, nor would

> they shrink from the fiery arrows to which an attempt to stay the plague would expose them. But they withhold their hand from the consideration of the fruitlessness of the effort to reason against such sublimated folly, such double distilled nonsense, as popular credulity is perpetually swallowing. [66]

Yet we could still trace the skeptical tradition back much further. Consider the 1784 *Rapport Des Commissaires chargés par le Roi, de l'Examen du Magnétisme animal*.[67] Appointed by the King of France, Benjamin Franklin, Antoine Lavoisier, and other scientific luminaries formed a Royal Commission charged with investigating a pseudoscientific healing fad called Mesmerism or "animal magnetism." Like modern scientific skeptics, the Commissioners deliberately ignored Mesmerism's untestable metaphysical ballyhoo (animal magnetism was said to be an undetectable "universally spread fluid…the means of a mutual influence between celestial bodies, the earth, & living bodies,"[68] much like "the Force" in *Star Wars*) and zeroed in on its testable claims.[69] Although Mesmerism was very popular among the French aristocracy, this "testable claims" approach did not reflect some sort of political cowardice on the part of Benjamin Franklin or the Commission; it was simply the only way their work could be rigorous—or useful. Consider the problem as they described it:

> Animal magnetism embraces the whole of Nature…but it did not take long for the Commissioners to recognize that this fluid escapes detection by all the senses. Unlike electricity, it is neither luminescent nor visible. Its action does not manifest itself visibly as does the attraction of a magnet; it is without taste or smell; it spreads noiselessly & envelops or penetrates you without your sense

> of touch warning you of its presence. Therefore, if it exists in us & around us, it does so in an absolutely undetectable manner.[70]

How could anyone determine whether or not these assertions were true? The Commissioners came to understand that they couldn't—not directly. Instead, they could only investigate the alleged "existence of magnetism through the action of this fluid, creating changes in animate bodies."[71] Nor could they rely on anecdotal cases purporting to show Mesmerism's healing action; the results of treatments are "are always uncertain & often misleading," if only because so many illnesses self-correct in time. They needed to lock down Mesmerism's all-too-fluid claimed effects to something they could *test*. "The Commissioners have had to confine themselves to purely physical proofs, that is, to the temporary effects of the fluid on the Animal body, by stripping these effects of all illusions possibly mixed up with them, & making sure that they cannot be due to any cause other than Animal magnetism."[72] To this end, the Commissioners tested (for example) the claim that a sensitive patient could feel which specific area of her body was being magnetized.

> The sensitivity of the woman being well established, it was only a question of protecting her from her imagination, or at least of getting it out of the way. The Commissioners proposed to blindfold her so that they could observe the nature of her sensations while experimenting without her knowledge. She was blindfolded & magnetized; whereupon the phenomena no longer corresponded to the places where the magnetism was directed.[73]

Worse, the blindfolded patient "felt" the effects of the magnetization when she was "was made to believe that she was magnetized," even when "nothing was done to

her from near or afar." These and similar experiments were "consistent & also decisive; they authorize the conclusion that the imagination is the real cause of the effects attributed to magnetism."[74]

Publishing the Commission's report in English translation for the first time, *Skeptic* magazine publisher Michael Shermer felt obliged to defend the paper this pivotal document was printed on. "It is not a waste of space because the history of skepticism and the skeptical movement should be tracked and recorded as any field should be," Shermer argued, "and this is the first scientific investigation that we know of into what would today be considered a paranormal or pseudoscientific claim."[75] It is unsettling that one of skepticism's leading practitioners should feel pressured to apologize for making available and discussing the essential history and methods of our field. (Happily, he was not discouraged by this pressure. A historian, Shermer is one of the few skeptics to have devoted significant attention to the exploration of skeptical history, publishing key historical documents and valuable oral history interviews in the pages of *Skeptic*.)[76]

Over 100 years before Franklin's investigation into Mesmerism, English medical doctor Sir Thomas Browne attacked a broad swath of popular falsehoods in his 1672 debunking book, *Pseudodoxia Epidemica: or Enquiries into Commonly Presumed Truths* (also known as *Vulgar Errors*). Written in the early grey dawn of the scientific era, *Pseudodoxia Epidemica* may seem peculiar to modern readers. Many of the common myths Browne addressed have largely passed out of history, such as the idea that chameleons eat only air, or that diamonds are made soft by the blood of a goat, or that "the flesh of Peacocks corrupteth not." But there is much that is familiar, too.

Browne spoke out against our old friends the psychics ("Fortune-tellers… Geomancers, and the like incantory Impostors") and alternative medicine providers ("Quacksalvers, and Charlatans" whose "Impostures are full of cruelty, and worse than any other; deluding not only unto pecuniary defraudations, but the irreparable deceit of death"[77]). Even such seemingly modern notions as magnetic insoles are foreshadowed in *Pseudodoxia Epidemica*. Browne described how lodestones (naturally occurring magnets) were worn in his day as amulets, "For perceiving its secret power to draw magnetical bodies, men have invented a new attraction, to draw out the dolour and pain of any part" of the human body.[78] Regardless of the particulars, it's Browne's underlying approach that rings the most familiar. He drew heavily on the new empiricism of his time, emphasizing direct observation and experiment. Even more relevant to the history of skepticism, he devoted several chapters to the discussion of how thinking goes wrong, in effect discussing scientific illiteracy, deliberate for-profit deception, and various fallacies such as begging the question ("*petitio principii*"), confusing correlation and cause, and (a major theme of his book) arguments from authority. An advocate for experimenting, Browne took exception to "Supinity, or neglect of Enquiry, even of matters whereof we doubt"—for scoffing is fundamentally opposed to the truth-seeking, investigative spirit we have since come to call science. I wish every climate science denier or 9/11 Truther would take to heart Browne's pointed warning about pseudo-skeptical, *a priori* disbelief:

> And as credulity is the cause of Error, so Incredulity oftentimes of not enjoying truth; and that not only an obstinate incredulity, whereby we will not acknowledge assent unto what is reasonably inferred, but any…skeptical infidelity against the evidence of reason

> and sense. For these are conceptions befalling wise men, as absurd as the apprehensions of fools, and the credulity of the people which promiscuously swallow any thing.[79]

Nor was Browne the earliest to write skeptically on paranormal topics and debunk popular misconceptions. Thomas Ady's extraordinary 1655 volume *A Candle in the Dark* (the namesake for astronomer Carl Sagan's 1996 skeptical masterpiece *The Demon-Haunted World: Science as a Candle in the Dark*) shone a spotlight into two different pools of shadow: the baseless persecution of people accused of witchcraft, and the scams by which con artists *pretend* to perform paranormal feats. Written in England four decades before colonial Massachusetts' Salem witch trials, *A Candle in the Dark* scathingly described the superstitions driving accusations of witchcraft—and the nihilistic horror of the methods used to coerce confessions:

> And for further confirmation of the matter, they have devised, among other tortures, to make people confess that they can do such impossibilities, one of the most devilish cruelties that hath been devised among men, and that is, to keep the poor accused party from sleep many nights and days, thereby to distemper their brains, and hurt their fancies, at length to extort confession from them, and then to bring their own confession as an evidence against them; and if they cannot make them confess, they torture one of their little children to make it accuse their parents, and that they call confession; this trick will tame any wild beast, and make it tractable, or any wild hawk, and make it tame…how much more may it make men or women yield to confess lies, and impossibilities?[80]

Ady brought both Scriptural and evidence-based arguments to bear against the witch trials (he discussed at some length the variables that can make one person sink while another floats[81]), but we'll set aside the gruesome trials and Ady's objections to them. Most interesting from the perspective of skeptical history is Ady's keen understanding of the psychological factors at work. For example, he understood that mental illness caused some people to falsely confess to witchcraft: "mark well their distemper, and you shall find that they are deeply gone by infirmity of body affecting the mind, whereby they conceit such things as never were, or can be," Ady wrote.[82] He pointedly asked why their mental illness had fixed upon this particular delusion, and who bore the blame for that tragedy: "truly if such doctrines had not been taught to such people formerly, their melancholy distempers had not had any such objects to work upon, but who shall at last answer for their confession, but they that have infected the minds of common people with such devilish doctrines, whereby some are instigated to accuse their poor neighbors of impossibilities contrary to the Scriptures, and some drawn to confess lies, and impossibilities contrary to Christian light?"[83]

Ady was a Christian, and actually did believe that "witches" existed—but his definition took me by surprise. In Ady's view, genuine witches were not supernatural, but humans who led other people into idolatry or away from a proper understanding of god—especially by performing bogus miracles. His witches were *phony paranormal claimants*, many of exactly the same types skeptics expose today. Ady described several classes of psychic scam, and even some of the techniques that made them possible. Some con artists pretended to receive prophetic messages or insight by some system of divination, "yet it was altogether a cozening imposture,

or uncertain guessing, or conjecturing"[84] (Ady mentions some who cast bones, and others who "observed the entrails of beasts, from whence they pretended they did know the will of the gods"[85]). Like modern skeptical magicians, Ady poured scorn on those who performed the tricks of stage magic under the pretense that they were genuine miracles. These scammers, Ady wrote, accomplished their deceit through sleight of hand, through confederacy ("that is, when many or a few agents do agree together in bringing to pass cheating impostures"[86]) and through the cunning "abuse of their knowledge of natural causes…."[87] Ady described routines and props for a number of magician's tricks in detail, and then—in a remarkable moment of skeptical history—argued that stage magicians have a useful role in debunking bogus miracle-mongers. The real trouble does not come from performers "who play their tricks in fairs and markets, nor gentlemen who sometimes in imitation of them, do in sport, play tricks of sleight of hand, or legerdemain, with confederates or without," Ady argued; indeed, "it is most certain and true, that if it be rightly understood, that these do a great deal of good, that recreation tending rightly to the illumination of people of all sorts, to show them the vanity and ridiculousness of those delusions and lying wonders, by which men were so easily deluded…."[88] Beyond this prescient suggestion of the shape of skepticism to come, Ady went on to expose moving statues (controlled by wires) weeping icons (fed by pipes) bogus spirit mediumship (disguised voices from concealed confederates) and so on. Amazing!

Decades before Ady, French essayist Michel de Montaigne skewered a wide range of impostures and human foibles, including "prognostication"—fortune-telling or psychic prediction, whether by oracles, divination using the entrails of animals, or

other means. His 1580 book *Essais* nailed a key concept that skeptics often discuss today: remembering the hits, and forgetting the misses. "I think never the better of them for some such accidental hit,"[89] Montaigne wrote. "There would be more certainty in it if there were a rule and a truth of always lying. Besides, nobody records their flimflams and false prognostics, forasmuch as they are infinite and common; but if they chop upon one truth, that carries a mighty report, as being rare, incredible, and prodigious." Montaigne spoke 400 years ago of the ease with which people are misled, but warned against the arrogant scoffing that remains scientific skepticism's Achilles heel today: "on the other hand, 'tis a foolish presumption to slight and condemn all things for false that do not appear to us probable; which is the ordinary vice of such as fancy themselves wiser than their neighbours."[90]

Scientific skepticism—not just philosophical doubt, but specifically the study, criticism, and investigation of paranormal claims—is a practice with very deep roots. Skeptical investigation is older than science itself. Indeed, the practice, problems, and central concepts extend all the way to antiquity (including a *Scooby-Doo*-like debunking tale told in some versions of the Old Testament—a tale of a "living" statue exposed as a scam by a clever on-site skeptical investigation).[91]

Consider the case of Lucian of Samosata's second century C.E. exposé of a ruthless psychic confidence man, Alexander of Abonoteichus.[92] Lucian's critical biography of Alexander is almost shockingly familiar: a straight-up skeptical case study, complete with detailed debunking and in-person investigation. It is so modern in tone and approach, so specific to a set of paranormal claims, so free of extraneous

concerns that it could have been written last week by James Randi, rather than by a Roman who lived almost two millennia in the past. As the *Fortean Times* put it, Lucian's book "has a double interest: apart from the fascinating detail it contains, it shows us a second-century sceptic at work, debunking his subject in a way that would make contemporary hyper-rationalists proud."[93]

In the midst of the Roman Empire's greatest period of prosperity and peace, Alexander of Abonoteichus set himself up as the head of a snake-god cult—and made himself wealthy with a billet reading routine identical in essence to those performed by fraudulent spirit mediums to this day. Lucian's critical biography (addressed as a letter to a skeptical colleague) describes the effect:

> Alexander announced to all comers that the god would make prophecies…. He directed everyone to write down in a scroll whatever he wanted and what he especially wished to learn, to tie it up, and to seal it with wax or clay or something else of that sort. Then he himself, after taking the scrolls and entering the inner sanctuary…proposed to summon in order, with herald and priest, those who had submitted them, and after the god told him about each case, to give back the scroll with the seal upon it, just as it was, and the reply to it endorsed upon it; for the god would reply explicitly to any question that anyone should put.
>
> As a matter of fact, this trick, to a man like you, and if it is not out of place to say so, like myself also, was obvious and easy to see through, but to those drivelling [sic] idiots it was miraculous and almost as good as incredible. Having discovered various ways of undoing the seals, he would read all the questions and answer them

> as he thought best. Then he would roll up the scrolls again, seal them, and give them back, to the great astonishment of the recipients, among whom the comment was frequent: "Why, how did he learn the questions which I gave him very securely sealed with impressions hard to counterfeit, unless there was really some god that knew everything?"[94]

The techniques Lucian and other Roman skeptics developed to test such paranormal claimants are as disconcertingly familiar to modern skeptics as the claims themselves. (Familiar too—and unfortunate—is Lucian's elitist scorn for those taken in by such claims.) Modern skeptical investigators often set traps for psychics suspected of cheating by intentionally supplying false information. In 2001, for example, Joe Nickell took part in several billet-readings at a notorious center for spirit mediumship, Camp Chesterfield. Nickell's billets provided fake names for himself ("James Collins") and for nonexistent relatives, among other misinformation. The Chesterfield mediums who selected his billets gave readings that reflected the fake information without detecting that Nickell was hoaxing them. One medium "gave me an endearing message from my supposedly departed mother that answered a question I had addressed to her on the billet. However, my mother was actually among the living and, of course, not named Collins."[95] Lucian set similar traps almost two thousand years before Joe Nickell was born. Lucian knew that Alexander secretly opened the billets from many clients, but that he would resort to other methods if the scrolls proved impossible to open without signs of tampering—either sourcing the concealed information by subterfuge, or simply making up gibberish answers that supposedly came to him in dreams. He confirmed these practices in a series of tests. "When I asked whether Alexander was

bald, and sealed the question carefully and conspicuously," Lucian found, the answer was meaningless nonsense.

> At another time, I asked a single question in each of two scrolls under a different name, "What was the poet Homer's country ?" In one case, misled by my serving-man, who had been asked why he came and had said, "To request a cure for a pain in the side," he replied: "Cytmis I bid you apply, combined with the spume of a charger."
>
> To the other, since in this case he had been told that the one who sent it enquired whether it would be better for him to go to Italy by sea or by land, he gave an answer which had nothing to do with Homer: "Make not your journey by sea, but travel afoot by the highway."
>
> Many such traps, in fact, were set for him by me and by others. For example, I put a single question, and wrote upon the outside of the scroll, following the usual form: "Eight questions from So-and-so," using a fictitious name and sending the eight drachmas…. Relying upon the fee that had been sent and upon the inscription on the roll, to the single question: "When will Alexander be caught cheating?" he sent me eight responses which, as the saying goes, had no connection with earth or with heaven, but were silly and nonsensical every one.[96]

We may not ever be able to truly share the perspectives of the past, but it's nearly impossible for me not to view Lucian as a thoroughly modern skeptical activist. He challenged faux-paranormal claims, not merely with armchair reason but with tests

devised to expose fraud. "His attitude involves not only resolute disbelief; it involves the rational investigation of the mechanisms at work behind the stage," notes classicist Diskin Clay, adding "Lucian is interested in the machinery of deceit."[97] Lucian wrote about his findings for the edification of the public, saying "I think too that to its readers the writing will seem to have some usefulness, refuting as it does certain falsehoods and confirming certain truths in the minds of all men of sense."[98] It even seems that there may have been something like a network of skeptics who knew each other's work and contributed to a debunking literature.[99] Lucian's exposé was addressed to a colleague named Celsus, who had urged Lucian to "set down in a book…the history of Alexander, the impostor of Abonoteichus, including all his clever schemes, bold emprises, and sleights of hand…." This Celsus was evidently a debunker himself. Discussing Alexander's specific techniques for secretly opening billets, Lucian wrote to Celsus, "There are many other devices to this end, but they need not all be mentioned…especially in view of the fact that in the book which you wrote against the sorcerers, a very good and useful treatise, capable of preserving common-sense in its readers, you cited instances enough, and indeed a great many more than I have."[100]

We'll leave this ancient trail with Lucian and his colleagues, and turn our attention to the modern development of this long-evolving literature. But before we do, I'll ask you to pause for a moment and reflect that this does not even begin to plumb the depths of skeptical history. Skepticism is a story without a beginning or an end. Across millennia, across our world, and across our many cultures, humanity has always known the tension between claims that seem too good to be true, and the suspicion that they probably are.

Part Two: The Purpose of Scientific Skepticism

Modern Skepticism's Unique Mandate

If the critical study of paranormal claims extends back to antiquity, why do most skeptics consider the 1976 formation of the first successful North American skeptical organization, CSICOP, to be the "birth of modern skepticism" (at least for the English-speaking world)?

The difference is between the long-standing *genre* of individual skeptical writing, and the recognition that this scholarship collectively comprised *a distinct field of study*. With the creation of an organization to pursue that work (and soon the emergence of a global network of many such groups) came the accoutrements of any serious field: discussion of best practices; recognition of specialist expertise; periodicals for the publication of new research; infrastructure such as legal entities and buildings; and, eventually, even professional positions for full-time writers and researchers. Together—falteringly, at first, but together—these newly organized skeptics got to work on their unique mandate.

To better appreciate the dimensions of that distinct mission—the much-discussed "scope" of scientific skepticism—it's necessary to consider the other movements, organizations, and scholarly fields that already existed in North America before CSICOP was formed:

There was already an atheist movement. Although the term "New Atheism" dates back only to 2005, American Atheists was formed in 1963.[101] Thirteen years before the formation of CSICOP, atheist activists had already overturned school prayer in the United States Supreme Court—and of course the "Freethought" movement goes back much further. German Freethinkers who flowed into the United States in the mid-1800s established groups that still exist today. (The oldest I'm aware of is the Sauk County Freethinkers, established in 1852, whose first Speaker wrote that the means to "mental and moral freedom…are not 'supernatural and incomprehensible means of grace,' but the natural and comprehensible means by which a human being influences and inspires the mind and heart of his fellows—through speech, song, and the mutual exchange of opinions."[102])

Being a part of that Freethought tradition, there were of course already humanist organizations and humanist media many decades before CSICOP was formed. In fact, CSICOP was a spin-off from the venerable American Humanist Association. It was conceived at an AHA conference[103] as a distinct group with a distinct mandate. Founder Paul Kurtz recalled, "CSICOP was originally founded under the auspices of the *Humanist* magazine, sponsored by the American Humanist Association. But the Executive Council decided immediately that it would separately incorporate and that it would pursue its own agenda."[104]

Similarly, before CSICOP there were already groups and movements working to advance democratic ideals, civil rights, and feminism. There were already groups fighting for gay rights, for church-state separation, and against racial discrimination. There were already environmental groups.

Likewise, science advocates already existed. There were already science popularizers. Science education and science journalism were established professional fields before CSICOP came along.

CSICOP was even predated by an *existing movement to promote critical thinking* (a movement that still exists) known not-too-creatively as "the critical thinking movement."[105] Since the 1970s, this educator-driven pedagogical movement has been hard at work on a project that skeptics sometimes imagine we should invent: reforming education across all grade levels to teach critical thinking skills, in order to foster a more rational society. Without any particular contact with (or need for) the skeptical movement, the critical thinking community boasts its own non-profit organizations, technical literature, and decades of annual conferences.

With all those movements doing all that work, why bother forming CSICOP? If other movements already promoted humanism, atheism, rationalism, science education and even critical thinking, what possible need could there be for organizing an additional, new movement—a movement of people called "skeptics"?

Scientific Investigation of Claims of the Paranormal

CSICOP—and with it the global network of likeminded organizations that CSICOP inspired, such as the JREF and the Skeptics Society—was created with the specific yet ambitious goal of filling a very large gap in scholarship. The skeptical movement sought to bring organized critical focus to the same ancient problem that isolated, outnumbered, independent voices had been struggling to address for centuries: a virtually endless number of unexamined, potentially harmful paranormal or pseudoscientific claims ignored or neglected by mainstream scientists and scholars. "The gap means there is a danger that high-level scientific competence may not be applied in examining paranormal and fringe science claims," explained *Skeptical Inquirer* Editor Kendrick Frazier in 2001. "This is where I think CSICOP, the *Skeptical Inquirer*, and the skeptical movement in general come in. We help fill that gap. We are in effect a surrogate in that area for institutional science."[106] Many of the people who undertook the work of this newly organized skepticism were *personally motivated* by the social justice implications of this neglected gap in scholarship (shouldn't someone protect the sick from con artists?) but it was the *gap itself* that they organized to fix.

In 2001 Paul Kurtz recalled, "I am the culprit responsible for the founding of the Committee for the Scientific Investigation of Claims of the Paranormal. Why did I do so? Because I was dismayed in 1976 by the rising tide of belief in the paranormal and the lack of adequate scientific examinations of these claims."[107] Setting the "rising tide" rhetoric aside (every generation of skeptic has interpreted the paranormal as posing a uniquely urgent problem in their time) the mandate at

CSICOP's inception was very clear. Organized skeptics would set aside *a priori* scoffing and strive to become honest brokers, actively working to learn what light the methods of science and scholarship could shine on the vast and long-established portfolio of skeptical topics.

To that end, the scope of the skeptical project was explicitly defined as the investigation of *exclusively empirical claims*—not just additional opinion, not merely an attitude of doubt, and not simple sniping from the other side of the burden of proof. The first issue of North America's founding skeptical periodical was unapologetic about this just-the-facts mandate.

> This journal, the official organ of the Committee for the Scientific Investigation of Claims of the Paranormal, is intended to communicate scientific information about the many esoteric claims that have shown a growing influence upon the general public, educational curricula, and scientific institutions themselves. … Finally, a word might be said about our exclusive concern with *scientific* investigation and *empirical* claims. The Committee takes no position regarding nonempirical or mystical claims. We accept a scientific viewpoint and will not argue for it in these pages. Those concerned with metaphysics and supernatural claims are directed to those journals of philosophy and religion dedicated to such matters.[108]

That same inaugural issue of the magazine that would soon be renamed the *Skeptical Inquirer* amplified that "the purpose of the Committee is not to reject on *a*

priori grounds, antecedent to inquiry, any or all claims, but rather to examine them openly, completely, objectively, and carefully."[109]

Think about the sheer, sustained toil this aspiration called for. After all, it's not easy to be open-minded about every bizarre question to come down the pike, let alone to try to solve them all—and it doesn't get easier after you've seen a thousand similar claims come to nothing. Nonetheless, although skepticism is often denigrated as a club for scoffers (even, if you will, "scoftics"[110]), the goal for CSICOP was the opposite of armchair debunking. Kurtz explained in 1985:

> How shall people in the scientific and academic community respond to the challenge of paranormal claims? The response should be, first and foremost, 'By scientific research.' In other words, what we need is open-minded, dispassionate, and continuing investigation of claims and hypotheses in the paranormal realm. … The dogmatic refusal to entertain the possibility of the reality of anomalous phenomena has no place in the serious scientific context. The hypotheses and data must be dealt with as objectively as possible, without preconceived ideas or prejudices that would mean the death of the scientific spirit.[111]

Organized skepticism was thus not the place for people to talk big about their beliefs or their disbeliefs, but instead to ante up concrete evidence one way or the other. As Kurtz bluntly concluded, "proof or disproof is found by doing the hard work of scientific investigation." After all, opinions are like noses[112]—everyone's got one, and *everyone already had one without organized skepticism.* Scientific skeptics set

out to discover and provide something more useful: demonstrable, verifiable facts on which the public could rely.

CSI's "follow the evidence" approach (I hope I may be forgiven for hearing hits by *The Who* in my head when attaching the word "evidence" to CSICOP's new name) became the enduring engine for an organization, which grew into a network of organizations, which grew into a movement. When I discovered skepticism (over 20 years ago) the empirical "testable claims" approach had been long established as the skeptical movement's central unifying principle—as central to skepticism as evolution is to biology.[113] The Skeptics Society, for example, was from the outset committed to this scientific framework. "With regard to its procedure of examination of all claims, the Skeptics Society adapts the scientific method,"[114] affirmed the first issue of *Skeptic* magazine in 1992. "The primary mission of the Skeptics Society and *Skeptic* magazine," Michael Shermer emphasized elsewhere, "is the investigation of science and pseudoscience controversies, and the promotion of critical thinking. We investigate claims that are testable or examinable."[115] The sheer overwhelming practicality of concentrating on the investigable[116] aspects of paranormal claims—of investigating those things *which can be investigated*—inspired a generation of skeptics like me. As Steven Novella and David Bloomberg explained in 1999, "The position of scientific skepticism is consistent, pragmatic, and allows the skeptical movement to precisely and confidently define the focus of its mission."[117]

It was also the best guarantee of skepticism's integrity. When skepticism serves up opinion, it is just more noisy punditry. When skepticism can be counted on to

deliver the demonstrable facts, it becomes, like *Consumer Reports*, a useful public service.

"Testable Claims" is Not a "Religious Exemption"

Skeptics like Steven Novella insist that sticking to the realm of science is "about clarity of philosophy, logic, and definition"[118] rather than strategic advantage or intellectual cowardice,[119] but some critics find this position unsatisfying—or even suspicious. What are we to make of accusations that skepticism's "testable claims" scope is a cynical political dodge, a way to present skeptics as brave investigators while conveniently arranging to leave religious feathers unruffled? Like the other clichés of my field ("skeptics are in the pocket of Big Pharma!") this complaint is probably immortal. No matter how often this claim is debunked, it will never go away.

Nonetheless, it is grade-A horseshit. It's become a kind of urban legend among a subset of the atheist community—a misleading myth in which a matter of principle is falsely presented as a disingenuous ploy. There is (and this cannot be emphasized enough) *no "religious exemption" in skepticism*. Skeptics *do* and *always have* busted religious claims.

That's so important and so often misunderstood that I'm going to repeat it: collectively, *scientific skepticism has never avoided claims because they are religious in nature*—not for political expediency, not to "coddle" anyone, and not for any other reason. As magician Jamy Ian Swiss (founder of the New York Skeptics) explained

in a thundering main stage speech at the James Randi Educational Foundation's Amazing Meeting 2012 conference, the notion that skeptics grant religion "any sort of special pass…is not only a weak position, I don't think it's a real position. It's an imaginary one. It's one I only seem to hear or see as a straw man that atheist activists accuse skeptics of promoting."[120] Let me amplify that still further: anyone who makes the argument that the testable claims scope is a deliberate ploy to "avoid offending the religious" is either unfamiliar with the literature of scientific skepticism, or chooses to misrepresent it.

Now, here's what actually *is* true: scientific skeptics investigate claims that *can be investigated* (religious or otherwise) and we set aside claims that *cannot be investigated* (again, religious or otherwise). The "religious" part is irrelevant. It comes up on both sides of the testability equation, so just cross it out and forget about it. The only relevant distinction is simply *whether empirical evidence is possible.* If we can't collect evidence, then tough—we can't. If we *can* collect evidence, then we do, regardless of whom that evidence may offend.

"If someone says she believes in God based on faith," clarified Michael Shermer, "then we do not have much to say about it. If someone says he believes in God and he can prove it through rational arguments or empirical evidence, then, like Harry Truman, we say 'show me.'"[121]

The textbook example of the testable claims scope applied to religion by scientific skeptics is James Randi's exceedingly public humiliation of Peter Popoff, a popular Christian minister. Popoff's multi-million-dollar ministry was built on his

reputation as a faith healer who received (it appeared) miraculous knowledge about the medical health and personal details of the faithful in the audience.

Where an atheist activist might have railed against the *a priori* implausibility of these performances, Randi and his allies (from the Houston Society to Oppose Pseudoscience,[122] the Society of American Magicians, and the Bay Area Skeptics[123]) instead took scientific skepticism's much more concrete path: they broke Popoff's schtick down to its testable components, *and then literally tested them.*

This point is worth highlighting. A lot of the work of "scientific skepticism," such as my own historical sleuthing, is "scientific" only in the broadest sense: it is critical, evidence-based, and works within an empirical framework. But Randi's 1986 Popoff investigation involved *direct hypothesis testing* (and, hell, even machines that go beep). Setting aside untestable metaphysical speculations, Randi's team hypothesized that Popoff's information was harvested directly from the audience. They tested this by seeding the audience with skeptical activists. Randi explained that before his dedicated group of volunteers distributed themselves throughout the audience,

> I instructed them to allow themselves to be approached, and to give out incorrect names and other data whether they were "pumped" by questioners, asked to fill out healing cards, or both. They were told to supply slightly different sets of information to the two data inputs, so that if any of them were "called out" we could tell from the incorrect information just which method had been used.[124]

Sure enough, Popoff called out Randi's people by their false names, and fed back their planted, bogus information. Armed with this result, Randi and his colleague Steve Shaw (a skeptic and professional magician who performs under the name Banachek[125]) further hypothesized that this information was passed to Popoff electronically.

> When Steve and I saw Popoff dashing up and down the aisles calling out as many as 20 names, illnesses, and other data, one after the other, we knew something more than a mnemonic system was at work. I said to Steve, "You know what to do?" He replied: "Yep. I'll go look in his ears." And he did, almost bowling the evangelist over as he bumped up against him to get a good look. Steve saw the electronic device in Popoff's left ear. When he reported this to me, I knew what my next step would be.[126]

The following week, Randi, the Bay Area Skeptics, and an electronics specialist named Alexander Jason were ready for Popoff's performance in San Francisco. The night before Popoff's event, Jason scanned the radio frequencies active at the same auditorium. With those frequencies saved and filtered out, Jason and Bay Area Skeptics founder Robert Steiner were easily able to dial in to the Popoff operation's radio frequency.[127] Tape rolling, the team recorded Popoff's wife secretly feeding him harvested information about members of the audience, which he fed back the audience as an apparent miracle. Popoff was caught red-handed.

Randi revealed this incontrovertible evidence on network television, on the *Tonight Show with Johnny Carson*, airing videotape from the Popoff event with the secret radio transmission overlaid for the television audience to hear. Ouch. The scandal

broke the back of this popular Christian ministry: Popoff declared bankruptcy in 1987. (After a period of humiliated obscurity, Popoff built a new ministry—now even more profitable. Randi reflected in a 2007 *Inside Edition* interview that this was not surprising: "Flim flam is his profession. That's what he does best: he's very good at it, and naturally he's going to go back to it."[128])

Scientific skeptics accept scientific limits. These limits are not conjured up to annoy people, nor adopted for strategic convenience; they're simply baked into the nature of science. "If it is not measurable even in principle," Michael Shermer explained, "then it is not knowable by science."[129]

Contrary to common misconception, this empirical standard is not something skeptics apply only to claims that are considered sacred in modern traditions. *The exact same scientific/non-scientific distinction applies to all claims, regardless of their content.* Steven Novella explained yet again in 2010, "It is absolutely not about ghosts vs holy ghosts…. Any belief which is structured in such a way that it is positioned outside the realm of methodological naturalism by definition cannot be examined by the methods of science." Novella went on: "The content of the beliefs, however, does not matter—it does not matter if they are part of a mainstream religion, a cult belief, a new age belief, or just a quirky personal belief. If someone believes in untestable ghosts, or ESP, or bigfoot, or whatever—they have positioned those claims outside the realm of science."[130] Science is not able to demonstrate that undetectable metaphysical ghosts do not exist; only that *detectable* ghosts appear not to, and that many alleged hauntings have other explanations. We cannot determine whether or not homeopathic preparations are really "dynamized" with

undetectable vitalistic energy; we can discover whether they have greater treatment effects than a similarly administered placebo. We can't demonstrate that we ought to value liberty above the common good, or value security over liberty. We can't demonstrate that taxation is slavery, or that the means of production should be in the hands of the worker. We can't demonstrate that there is no afterlife, or that gay marriage is morally good, or that Kirk is better than Picard. We cannot demonstrate that Carl Sagan's neighbor has no invisible, undetectable dragon in his garage—but only proceed, as a methodological matter, on the basis that we are unable to discern any difference between an undetectable dragon and no dragon at all. Are untestable dragons ontologically identical to non-existent dragons? That's a question for bong hits in freshmen dorms. Science can't tell, and doesn't care.

Individual skeptics may have opinions about all those philosophical matters, but none of these are questions science can answer. As Novella and Bloomberg explained, "science can have only an agnostic view toward untestable hypotheses. A rationalist may argue that maintaining an arbitrary opinion about an untestable hypothesis is irrational—and he may be right. But this is a philosophical argument, not a scientific one."[131]

Irrational or not, like everyone else, I hold many strong and (I feel) well-reasoned philosophical opinions. Those are not scientific conclusions—they are opinions grounded in my personal values. I'll fight for them, but it would be dishonest for me to promote them while waving a "science-based" banner. Skeptics have a word for people who imply scientific authority for their non-scientific beliefs: "pseudoscientists."

Skeptics are Not Everythingologists

Accepting that any and all "testable claims" are *in principle* within the scope of scientific skepticism—and that untestable claims are, for reasons of principle (though also practicality) outside that scope—does it follow that skeptics should take the initiative to wade into mainstream scientific or academic controversies? Certainly we have often explored controversial areas beyond the paranormal, provided that those areas made testable claims. "The Skeptics also believe that science and rational skepticism can and should be applied to certain claims in the social sciences," affirmed Michael Shermer in 1992, "including testable statements made in such fields as psychology, sociology, economics, and political science."[132]

But does this broad critical exploration have practical limits? Reading a blog post about the scope of skepticism, I once happened to notice this sentiment expressed in one commenter's response: "the skeptical movement should strive to become the Snopes of all reality." Of all reality? This caught my eye—not only because it seems a little ambitious, but because I have often heard similar sentiments in recent years. In 2006, for example, CSICOP co-founder Paul Kurtz attempted to reposition the venerable organization as standing for "science, reason, and free inquiry in every area of human interest."[133] Not to put too fine a point on it (and of course Kurtz understood this practical issue[134]) but there are a *lot* of areas of human interest. Even assuming the "limited" scope of testable claims (a scope some newer skeptics are loathe to accept) it's worth asking what such a sprawling mandate—essentially, the critical study of *every knowable fact*—looks like in practical terms.

For centuries, skeptics have regarded it as a very bad sign when otherwise smart people weigh in on expert topics outside their own areas of expertise. In 1672, *Pseudodoxia Epidemica* author Thomas Browne included this among his many warnings about arguments from authority.

> Again, a testimony is of small validity if deduced from men outside of their own profession; so if Lactantius affirm the figure of the Earth is plain, or Austin deny there are antipodes; though venerable Fathers of the Church, and ever to be honored, yet will not their Authorities prove sufficient to ground a belief thereon.[135]

Lactantius was a flat-Earth-believing Christian advisor to the Roman Emperor Constantine, singled out centuries later for a sharp rebuke by Copernicus. In 1543, Copernicus wrote that he would disregard sniping from "babblers who claim to be judges of astronomy although completely ignorant of the subject," and scathingly noted that "Lactantius, otherwise an illustrious writer but hardly an astronomer, speaks quite childishly about the earth's shape, when he mocks those who declared that the earth has the form of a globe. Hence scholars need not be surprised if any such persons will likewise ridicule me. Astronomy is written for astronomers."[136]

Modern skeptics are very familiar with outsider contrarianism, and with the mischief it can cause. Hardly a day goes by here at *Skeptic* magazine without our getting letters from non-experts who feel they have blown the lid off evolution, Relativity, or some other major scientific theory or branch of expert knowledge. In 2006, for example, we received a press release asking, "What if the next groundbreaking discovery that changes the way we view science and geology is

spearheaded by someone outside the field?" The release promoted the idiosyncratic view of comic book artist Neal Adams, who believes "that the Earth was once smaller and somehow it grew. The surface, or crust, simply cracked apart, and the cracks opened up, producing new thin surface, a young surface. In this case the continents didn't move at all. They stayed where they were and moved outward."[137] As an illustrator myself (and a comics fan) I can attest that Mr. Adams earned every bit of his luminous professional reputation—but his profession is *illustration*, not geology. Expertise in one field does not make us experts in other, unrelated fields. Similarly outside their fields are hydrologists who attempt to debunk evolution, actors who seek to overturn the conventional view of the 9/11 events, comedians who promote contrarian theories about alleged new side effects of vaccination, and even famous biologists who deny the existence of HIV without benefit of relevant specialization. In all such cases, the combination of contrarian opinions, high certainty, and insufficient domain specific expertise adds up to a major, screaming red flag. Paleontologist Donald Prothero has termed the phenomenon of respected scientists blundering beyond their field of knowledge "the Linus Pauling Effect":

> The great Linus Pauling may have won two Nobel Prizes, but his crazy idea that megadoses of Vitamin C would cure nearly everything seems to have died with him. William Shockley may have won a Nobel for his work on transistors, but his racist ideas about genetics (a field in which he had no expertise) should never have been taken seriously. Kary Mullis may have deserved his Nobel Prize for developing the polymerase chain reaction, but that gives him no qualifications to speak with authority on his unscientific ideas about AIDS denial and global warming and astrology….[138]

So where does that leave us? Are self-identified skeptics less likely to make fools of ourselves when commenting outside our personal areas of expertise—perhaps by virtue of our interest in "critical thinking"? Unfortunately, the opposite may be true. Critical thinking is not a substitute for expert knowledge, no matter how much skeptics, creationists, 9/11 Truthers, or deniers of climate science might wish that it were. Applying strong critical thinking skills to insufficient knowledge leads us to perceive patterns and problems that don't really exist. Most pseudoscience arises from such feral critical thinking. "It would never be healthy for 'skeptics' to be more skeptical than the scientific community itself," Kendrick Frazier cautioned.[139] Skeptics who venture beyond the limits of our own expert knowledge are at least as vulnerable to becoming pseudoscientific cranks as anyone else. As Ray Hyman warned,

> No one, especially in our times, can credibly claim to be an expert on all subjects. Whenever possible, you should consult appropriate experts. We, understandably, are highly critical of paranormal claimants who make assertions that are obviously beyond their competence. We should be just as demanding on ourselves. A critic's worst sin is to go beyond the facts and the available evidence.[140]

Individually, skeptics are qualified for whatever we're actually qualified for—and nothing more. Some individual skeptics, of course, are scientists or scholars with the expertise to offer professional contributions to the technical literature within their own fields, but most of us are mere science enthusiasts. Collectively, the skeptical community is a mixed population made up largely of scientific amateurs. For that reason (as I argued in a 2009 article, "What, If Anything, Can Skeptics Say

About Science?"[141]) the skeptical movement has essentially no ability to contribute responsibly to the mainstream scientific literature, nor to resolve expert scientific controversies. The best we can hope to contribute in areas of genuine scientific knowledge is *useful description*. My children's book *Evolution: How We and All Living Things Came to Be* is such a descriptive project. What I aimed to do in the book was to describe what qualified scientists think. To do that, I had to seek out and describe the prevailing current of opinion, and then ask experts to check that I understood it correctly. That may not sound like much, but it took some doing. It's important to understand that occupations which "merely" describe the goings on within "only" the empirical scope of science—such as science journalism, science education, and science communication—are themselves established fields, each with an expert literature, university degree programs, and so on. In those expert fields, most skeptics (myself included) are amateurs.

Skeptics are not everythingologists. The idea that skeptics can shed light on every area of human endeavor is a hubristic daydream. But that does not mean we can't be experts on *some* things—even the best available experts. Which things, exactly?

How about, "Testable pseudoscientific and paranormal claims"?

Actually, Paranormal Scholarship is Hard, Too

How much do skeptics really need to know about the paranormal? Surely these, at least, are easy topics we can cut our teeth on without worrying too much about heavy technical details—right?

Well, not so fast. It's easy to scoff at mysteries involving psychics or Bigfoot or UFOs (doubt is cheap, after all) but *scoffing is not what scientific skepticism is for.* Deeply understanding these claims is a whole different challenge.

Many scientists have learned this the hard way. For example, it became something of a cliché for creationists to mop the floor with highly qualified biologists in debates about evolution. This was not because scientists lacked knowledge of science, but because those scientists lacked specialized knowledge of *nonsense*. That's where expert skeptics like Eugenie Scott and the National Center for Science Education are needed. The history and rhetoric of nonsense is a specialized niche arena—the arena of scientific skepticism.

Similarly, consider the embarrassment of scientists who endorsed tricksters as "genuine" psychics—after ignoring warnings from James Randi about the need for on-site involvement by trained magicians. In most mainstream scientific fields (such as climate science[142]) Randi is a layperson, and therefore vulnerable to making the same mistakes as any other layperson; but in his own area of expert knowledge (faux-paranormal chicanery) he is among the world's foremost experts. That doesn't make Randi (or any expert) infallible, but it does make him an experienced local guide in a land where mainstream scientists are tourists. His maps and safety tips are well worth following—as the parapsychological researchers at the McDonnell Laboratory for Psychical research learned to their sorrow. In a controversial[143] sting known as "Project Alpha" (1979–1983) Randi secretly sent two young conjurers to participate in experiments in the lab, and then *begged the laboratory to implement protocols that would have exposed Randi's own hoax.*

> Even before the boys were tested at the lab, I sent Phillips a list of eleven "caveats" concerning tests done with human subjects. For example, I warned him not to allow the subjects to run the experiments by changing the protocol. Similarly, I suggested capricious demands by subjects might well be the means of introducing conditions that would permit subterfuge. He was warned that reports of conditions should be very precise, assuming nothing. Above all, I urged that a conjuror be present. To that end, I offered to attend the McDonnell lab tests at my own expense, without any requirements that I be credited with any participation, or even attendance, in subsequent reports.[144]

Unfortunately, Randi's warnings were largely ignored. The lab never even asked the boys if they were cheating. (The conspirators agreed in advance to reveal all if the question was ever put to them directly.) Instead, the two young men were lauded for their sensational psychic abilities—until, three long years later, the boys and Randi revealed the hoax together. At a press conference, Randi posed the question to the boys: "Can you tell us, how do you do it?" The answer brought shocked gasps from the crowd: "Well, to be quite honest—we cheat." After this reveal (made all the more painful by the fact that the lab had eventually implemented tighter controls at the suggestion of Randi and other parapsychologists) the head of the McDonnell lab admitted to his credit that he "should have taken [Randi's] help earlier."[145]

Randi was not the first to sound this fundamental warning: *skeptical investigation of the paranormal is its own area of domain expertise*, within which it's as easy to stumble as it is within as any other expert field. Nor does self-identifying as "a

skeptic" lessen this danger. "It must be remembered that a skeptic is not a qualified investigator," cautioned magician and skeptical investigator Joseph Dunninger in 1935. "In fact, most skeptics are entirely untrained in investigation."[146] Even when critics are as seemingly well-matched to a given type of paranormal claim as magicians are to spirit mediumship, those skeptics may not have the *specific* expertise required to critique that claim fairly, nor to provide the public with accurate information.

> If magicians, generally, were capable, the psychic racket would have been ended long ago. The sad side of the story is that capable magicians are few. Those who are properly qualified to expose spirit mediums are frequently too busy traveling to concentrate upon damaging the reputations of mediums…. This leaves the battle to the "local" magicians; and in ninety-nine cases out of a hundred, a magician, if capable, would no longer remain "local." Thus the much vaunted campaigns that magicians have instituted against mediums have invariably dissipated, without the accomplishment of permanent results. … Apprentices are unable to do a craftsman's job. Magicians, unqualified in methods of psychic research, frequently hodge-podge their efforts. Worst of all, they lay their own measures open to ridicule.[147]

(As an example, Dunninger critiqued the 1931–1932 campaign against fortunetellers organized by Julien Proskauer and other skeptical activists within the Society of American Magicians. The climax of the campaign was a series of public demonstrations intended to show that mediumistic "spirit materializations" effects could be duplicated using the techniques of stage magic. But the attempt fizzled

badly, with heckling from the audience and the *New York Times* reviewing the magicians' replications as "not very convincing."[148])

Becoming genuinely knowledgable requires study, in skepticism as in any other field. Benjamin Radford took up this theme again in his 2010 primer, *Scientific Paranormal Investigation: How to Solve Unexplained Mysteries*.

> Skepticism, like science or any other body of knowledge, works on precedent. Scientific paranormal investigators need not—indeed should not—approach a case without background information and having researched previous investigations. While the specific circumstances of a mystery may be unique in each case, the type of mystery is not. Any investigation, from aliens to zombies, monsters to mediums to miracles, has many earlier solved cases as precedents. … Researching and knowing the history of skeptical investigations into paranormal claims is not simply a matter of paying your dues; it is essential to conducting an informed investigation.[149]

What are grassroots skeptics to do with that warning? On the one hand, it's dangerous for inexperienced skeptics to make public pronouncements on topics they don't know well. (I mean it can literally put people in danger: skeptics routinely weigh in on medical matters.) On the other hand, it's no good to set the bar for participation so high that no one can gain experience or help to do the work. (How else can we learn, except by study *and* practice?) Besides, as Radford notes, it's just not possible for anyone to "obtain and read every skeptical tome. The breadth of paranormal topics is so vast you'll never be conversant in everything."[150] I

have an entire bookcase in my library devoted solely to the decades of back issues of North American skeptical magazines (our primary semi-technical literature). Dozens of countries have produced similar mountains of periodical content. Countless hundreds of books and TV specials and lecture series have been produced. And all that is to say nothing of the content from blogs and podcasts. As of this writing, there are about 400 hours of back episodes of the *Skeptics Guide to the Universe* podcast alone—and there are over 60 ongoing skeptical podcast series, not counting shows devoted primarily to neighboring topics, such as secularism or straight science. It's no longer practical even to stay up to date with just the brand new skeptical podcast content being created as we speak. In 2011, Tim Farley's skeptical software tools blog calculated that there are were 2 hours and 16 minutes of new skeptical podcast material produced every day (and rising).[151]

And here's the thing: the *skeptical* material on any given paranormal topic is just a small fraction of the *relevant* literature on that topic. I have meters of shelf space in my library devoted to just the pro-cryptid literature on sea serpents, for example.

How can newer skeptics grapple with that colossal literature? How can anyone? I consider myself adequately conversant on only a handful of sub-sub-categories. How can the skeptical tradition be taught, its legacy preserved? Those are big questions, which we'll have to come back to in another essay. For now, it's enough to just stop for a moment and internalize the sheer scale of the literature within "just" skepticism's traditional scope of "just" testable paranormal claims—and consider how much we all have left to learn.

The Skeptics Movement is Not a Revolution

Readers may be forgiven at this point if they feel I've painted skepticism as workmanlike and difficult and limited, because I have. I presented the same argument in a more upbeat voice in my 2007 op-ed "Where Do We Go From Here?"[152] but today I'll just say it as plainly as I can:

Want to change the world? The skeptical movement will not do that—or at least, not radically. That's the truth of it. We're not going to bring about a New Enlightenment. We're not going to defeat the paranormal, or bring about a bright, rational dawn.

It's not that the lessons of skepticism aren't valuable or widely applicable—they are. And it's not that there aren't serious science literacy and science policy problems facing humanity. There definitely are. Nonetheless, the skeptical movement is in some senses penny ante, and it always will be. That's not a challenge to overcome; it's the nature of what we do. When we widen our scope beyond testable, scientific claims, we abandon the whole "science-based" point of the skeptical movement. When we branch out into other areas of domain expertise in mainstream science or scholarship, we swiftly find ourselves opining as amateurs, or worse, as pseudoscientific cranks. When we stick to the paranormal stuff we do well—our *only* unique contribution—we occupy a niche.

But that's what skeptics do. It's not a bug, but a feature. It is our task to work at the fringe, tackling the things that fall through the cracks, the topics other experts ignore. A hundred years from now (or two, or five) there will still be paranormal

beliefs, scams, and pseudoscience—and there will still be people (perhaps called "skeptics," or perhaps called something else) who try to shine light into those dark corners. It's been this way for millennia. It will go on.

Reflecting on his first 25 years of skeptical activism, Kendrick Frazier explained that "while the specific topics come and go, the more general manifestations of fringe-science, pseudoscience, and the paranormal persevere. … And it is only rational for scientists and skeptics to realize that. Any hope scientists and skeptics may have to abolish from public consciousness nonsense and irrationalisms in the name of science is doomed to failure."[153] This historical perspective is very important. Without it, new skeptics risk burnout and disappointment; with it, we are better able to appreciate the endless amount of small, local, human good that skepticism can do. "If I didn't think we were accomplishing something," Frazier went on, "I wouldn't be doing this."[154]

Skepticism is an ongoing, open-ended public service—and it matters. This is a point skeptics return to again and again. Consider the 1993 assessment from the head of the world's oldest extant skeptics organization, Belgium's Le Comité Belge pour l'Investigation Scientifique des Phénomènes Réputés Paranormaux. "We cannot expect to change the world," he said, looking back over decades of research and activism. "But even so," he continued, "we consider that is our duty to inform people about what we know on the basis of scientific research." It's the useful practical service that matters, not the failure to achieve utopia. As Tim Farley put it during the skepticism-themed "Skeptrack" at Atlanta's Dragon*Con convention in

2011, "Do you ever hear a firefighter say, 'Won't it be great when we win the war on flammability?'" Winning isn't the point. It's just a job that needs doing.

Other skeptics have used other service-oriented analogies. I've compared paranormal scams to mugging, and skeptics to cops:

> Despite the best efforts of police forces the world over, some violent muggings continue to happen. Mugging may be an unsinkable rubber duck, but it is still the case that *somebody* should show up, someone should take notice, when you are robbed. The fact that additional crimes will occur in the future is an irrelevance; it does nothing to negate the goodness of trying to reduce the number of muggings; nor should it stop us from trying to punish the person who mugged you; nor does it alter our ethical obligation to help current victims of crime.[155]

And yet, the comparison to firefighters and police officers may still be too grand. Science fiction author L. Sprague de Camp offered a more humbling analogy in the *Skeptical Inquirer* in 1986:

> The scientific debunker's job may be compared to that of the trash collector. The fact that the garbage truck goes by today does not mean that there will not be another load tomorrow. But if the garbage were not collected at all, the results would be much worse, as some cities found when the sanitation workers went on strike.[156]

It's a dirty, thankless, tedious, *endless* job. Someone has to do it, but let me ask you this: Are you sure that garbage collecting is your thing? Or more to the point, that it

is your only thing? "If skepticism is a Sisyphean task," I've argued, calling for involvement from grassroots skeptics, "then we will always need more people who are enthusiastic about rolling rocks."[157] But King Sisyphus' job was a hellish punishment. Besides, even if you're up for a little rock-rolling now and again, scientific skepticism is not the only rock around. The world has many movements worthy of support.

Happily, nobody has to choose one movement over another. People are complicated. We can be many things, in many movements and organizations, all at the same time. In fact, we have to be. No matter how much we may wish to "widen the scope" of this cause or that, we will never find a movement that speaks to the whole of our personal complexity.

I spend a lot of time talking about the virtues of focus and the limits of science, but I'm not a robot: I care about many things beyond my narrow professional field. I have political causes I wish personally to advance, moral principles to uphold, existential meaning to embody. I'm involved in many movements. I'm a skeptic, and *also* a humanist, and also an atheist, and also other things besides. In acknowledging my multiple distinct affiliations, I follow a respectable and old tradition in scientific skepticism. As National Center for Science Education Executive Director and Bay Area Skeptics Chair Eugenie Scott explains, "Most people have more than one identity: I'll wear my humanist hat in some circles, but not at the bee-keeper's meeting."[158]

Your own priorities may call you to many actions in many movements. Want to oppose religion, fight for church-state separation, or fix government? Those have

never been goals for scientific skepticism, but they are the explicit unifying goals for other movements that would deeply appreciate your help. So help them! Be a skeptic—and be other things besides.

The Seedbank

Skepticism can do a lot of good for a lot of people. Usually those victories are unglamorous and unsung: a child's curiosity ignited, a crook inconvenienced, a mother's fears of an apocalypse eased, a grandfather turned gently back toward scientific medicine. But it can be hard to fully *feel* the value of these local, immediate, human goods. Critics mock the effort involved; skeptics find themselves burned out and discouraged. It's easy to ask, "Why should skeptics bother studying stuff so far out on the fringe? Bigfoot? C'mon! Why not spent time on something that matters?"

One very stark answer is that some pseudoscientific claims demonstrably do matter a lot. Consider that AIDS denialism—the topic of the first issue of *Skeptic* magazine that I ever bought, way back in 1995—has racked up a death toll in the of hundreds of thousands in South Africa alone.[159] But that isn't the argument I'd like to leave with you today. After all, even the harshest critics of scientific skepticism will generally concede that someone ought to care about manifestly harmful beliefs. But what of the obscure, eccentric, arcane topics—the niche paranormalisms that appear to cause little harm? Why bother with astrology or ESP or the Loch Ness monster?

Here I'll offer one answer which may be less obvious: skeptical scholarship, like other arcane areas of scholarly study, can be viewed as a backup or reserve of expert knowledge. It's something like a genetic seedbank, or backup drive, or spare tire—an insurance policy taken out on the assumption that it's worth humanity's trouble to have, out of seven billion people, a handful of experts on Really Weird Things. What if, one day, we suddenly happen to need an expert on say, the occult practice of finding water with a magic stick? Oddly enough, such improbable-sounding, *Da Vinci Code*-like scenarios ("There's not a second to lose! Bring me the finest symbologist in all the land!") actually do happen.

Consider that magic stick topic, called "dowsing" or "water-witching." A subcategory of divining, dowsing for water and other precious substances is so old that its origins are lost in the mists of time. The subject was ably summarized in a 1938 book published by the United States Geological Survey, *The Divining Rod: a History of Water Witching*, by Arthur J. Ellis. This U.S.G.S. book includes a bibliography on the topic of dowsing that covers only the period of 1500–1916. That terse, small-print list of just that four-century sample from the literature of dowsing runs a whopping 28 pages! No wonder that the book's introduction (by groundwater hydrology pioneer Oscar Edward Meinzer) concludes,

> It is doubtful whether so much investigation and discussion have been bestowed on any other subject with such absolute lack of positive results. It is difficult to see how for practical purposes the entire matter could be more thoroughly discredited, and it should be obvious to everyone that further tests by the United States

> Geological Survey of this so-called "witching" for water, oil, or other minerals would be a misuse of public funds.[160]

Case closed, right? By 1938, there was nothing more for science to say. So why was James Randi still talking about dowsing rods fifty years later,[161] when I got mixed up in skepticism?

Not that I minded. I saw Randi's extensive testing and discussion of the exceedingly quaint topic of dowsing as a more-or-less arbitrary platform for teaching people about science. (I cannot, by the way, recommend more strongly the last chapter of Randi's book *Flim-Flam!*,[162] which describes his tests of paranormal claims such as dowsing. That chapter was a huge "Ah-ha!" for me, and should be considered essential reading for all skeptics.) Still, dowsing itself seemed awfully silly and harmless, even by my standards—and I *like* all that goofy paranormal stuff. It was hard to figure out why the Amazing Randi was meticulously documenting the failures of dowsing rods like the "Quadro Tracker," which were tested by several branches of government during the 1990s (despite the U.S.G.S. conclusion 50 years earlier that further dowsing tests "would be a misuse of public funds"). I mean, sure, the manufacturers of the Quadro Tracker were charging cash-strapped municipal governments a grand a pop for an inert plastic box with a radio antenna sticking out of it,[163] but does anyone *really* care about dowsing? It seemed trivial, y'know? It seemed like a side-show.

And then, suddenly, dowsing rods started killing people.

Over the winter of 2009 and 2010, headlines revealed that the Iraqi government had spent over $80-million on a Quadro-like plastic dowsing device called the "ADE 651" (at roughly $40,000 per unit) for the purpose of bomb detection.[164] According to its British manufacturer, the ADE 651 can detect "all types of narcotics and explosives" including "C4, C3, Semtex" through "all known substances which may be used to 'camouflage' the target substance" (even penetrating lead walls[165]). What's more, it can do all that from three miles up in the air.[166] These cartoonish, better-than-Superman boasts would be comical if their real world implementation weren't so chilling: these useless dowsing rods were deployed throughout war-torn Iraq's hundreds of bomb checkpoints. Weapons and explosives of course sailed right past the functionless plastic boxes—including bombs used to kill hundreds of men, women and children. After mainstream press outlets like the *New York Times* and the BBC seized upon this story, the British government moved to ban the export of ADE 651, and to arrest the man behind it.[167] But how did this press come about? Through the till-then esoteric dowsing knowledge of specialist skeptics.

In 2008, James Randi's contacts alerted him that the ADE 651 dowsing rod had been sold to the governments of Lebanon, Niger, and Iraq for use in bomb and land-mine detection.[168] As a long-time expert critic of dowsing, Randi followed up in October of 2008 by issuing a public challenge to the manufacturers of the ADE 651 device (and equally to its "distributors, vendors, advertisers, or retailers"): if they could demonstrate that device performs as advertised under fair test conditions, the James Randi Educational Foundation (JREF) would give that person one million dollars. Not one to pull a punch, Randi predicted that those who sell the ADE 651 "are criminals, liars, and thieves who will ignore this challenge because they know

the device, the theory, the described principles of operation, and the technical descriptions given, are nonsense, lies, and fraudulent."[169] (Randi's prediction proved correct: no one responded to this challenge.[170]) A year later, the JREF was still on the case. In October, 2009, on Randi's behalf, retired Lieutenant Colonel Hal Bidlack taught a crowd of security professionals about this class of bomb-detecting dowsing rods, at a conference about combatting improvised explosive devices, suicide bombers, and vehicle bombs (which was hosted by the U.S. Departments of State, Defense, and Homeland Security). Bidlack described the sorry history of demonstrably bogus dowsing devices marketed to first responders, explaining, "I am here today because of dangerous and immoral weasels. Weasels who attempt to sell junk that doesn't work, and puts your lives, and the lives of many others, in danger."[171] The news of Bidlack's talk reached *New York Times* reporter Rod Nordland, who was stationed in Baghdad, and who had seen the dowsing rods in use. Nordland phoned Bidlack, and—building on the JREF's expert knowledge—put together a story that blew the whistle on this deadly scandal. "Nearly every police checkpoint, and many Iraqi military checkpoints, have one of the devices," Nordland wrote, "which are now normally used in place of physical inspections of vehicles." Worse, "The suicide bombers who managed to get two tons of explosives into downtown Baghdad on Oct. 25, killing 155 people and destroying three ministries, had to pass at least one checkpoint where the ADE 651 is typically deployed, judging from surveillance videos," noted the incendiary *New York Times* article.[172] The news that Iraqi and American soldiers and civilians were at the mercy of *pretend* bomb-detectors erupted across international news networks and newspaper headlines, and led the British government to take action to ban exports of the devices. The effort James Randi and Hal Bidlack had expended years earlier

acquiring knowledge of something many would then have dismissed as perhaps the ultimate "quaint, harmless" paranormal claim almost certainly saved lives. To this, another skeptic was able to help add a measure of justice. Working with media and law enforcement, U.K. cognitive scientist Bruce Hood kept the pressure on.[173] In July of 2012, after a lengthy investigation, police formally charged the manufacturer of the ADE 651 and five other men with multiple counts of fraud.[174]

The lesson of this story is the central lesson of the history of scientific skepticism: nothing ever goes away. (Indeed, other bomb-detecting dowsing rods are being sold and deployed right now.[175]) No matter how fiercely a pseudoscientific idea is fought or debunked, no matter how often a "paranormal" mystery is solved, the likelihood —almost inevitability—is that it will return. Sometimes the wheel of popularity carries an idea out of the spotlight for a moment, or sometimes for a generation or more; but in the end, the wheel goes on turning. When those old, old ideas come back, it pays to have experts ready who remember and understand them. After all, *old chestnuts are only old to those who have seen them before.* Always there is a new crop of hopeful citizens, hard-working reporters and earnest law enforcement personnel ready to make the same old mistakes, ready to be swindled by the same old scams.

Worse, paranormal ideas evolve over time, developing new resistance and new vectors of transmission. Sometimes the most harmless old ideas (like dowsing) can suddenly develop into a virulent, lethal strain. When that happens, the tedious, dusty, never-ending work of skeptical scholars becomes something the world needs badly. As Hal Bidlack explained, "every once in a while we are presented with a

remarkable opportunity to do good, to fight against the chimera—to even in some cases, work to save lives."[176]

Community

That work matters. Maybe not as much as other tasks, or other movements—maybe not as much as *your* task—but it matters *enough*. There's still a need for a movement specifically, consistently, unfalteringly dedicated to that endless array of pseudoscientific claims. After all these centuries, the need for that work is still as great as it always has been. And skeptics are willing to do it.

If you're one of them, if you want to help with that work even some of the time—then welcome, a hundred times welcome. We need all the help we can get. Or, if you feel drawn more to some parallel rationalist movement, social justice cause, academic discipline, or faith group—then please, all the same, encourage scientific skepticism to do its tedious, useful work. The smallness of our cause does nothing to diminish the importance of yours.

At the Amazing Meeting 2012 conference (skepticism's big event) magician Jamy Ian Swiss took up this theme rather forcefully.

> If you self-identify as a skeptic but these issues somehow don't matter enough or particularly to you, and you think the dangers and ills of religion for example are what really matter, then I thank you sincerely for your support of skepticism. Please continue to attend our conferences, maybe even send us a contribution. And

> then also please go and devote yourself to the cause which you believe should be your personal priority. That's fine! All of that is good! You're still welcome in my skeptics tent. But the one thing that is neither fine nor good, is to come into my skeptics tent—and declaring that you are moving it![177]

I agree with his refusal to see the scientific skepticism broken down in conflation with other causes. This thing we do is something worth preserving, worth celebrating. It deserves clarity.

Yet consider the quieter implication of his analogy. The skeptical tent is not, after all, alone in this wilderness. This is a village, a community. There are many places here for us to rest, to belong, to contribute. There are tents for many moods and moments and missions and mandates. We needn't choose between them. We shouldn't! We may gather around the fires—share our stories and our fellowship—in as many as we like. When we do that, we make the tents warmer. We make many friends, share wisdom, find ways to help each other.

Whatever it is that you value, please do your own good work—the work that moves and inspires you, the work that makes the world better according to the priorities of your conscience—whatever that work is, and wherever you feel called to contribute. In doing that, in working as neighbors, we bring the village closer. Bigfoot or no Bigfoot.

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Endnotes

[1] Hering, Daniel W. *Foibles and Fallacies of Science.* (New York: D. Van Nostrand Company, 1924.) p. 1

[2] Used or promoted by Carl Sagan, Steven Novella and others, the phrase "scientific skepticism" as a descriptor or synonym for the skeptical movement is relatively recent. It has been widely adopted as a means of differentiating the niche literature of science-based, investigative skeptical critique of paranormal and fringe science claims—often called simply "skepticism"—from other types of doubt and from other uses of the word "skeptic" (such as fringe science "climate change skeptics"). However, the phrase "scientific skepticism" predates this current use within movement skepticism, and has at least one other meaning: "the attitude of constructive doubt appropriate for scientific practice"—a related but distinct meaning which can lead to confusion. In the context of this essay, I will use "scientific skepticism" as a synonym for science-based critique of paranormal and fringe science claims, for the literature that grew out of that critical practice, or for the movement that grew up around that practice.

[3] Pioneer programs *Skepticality* and the *Skeptics Guide to the Universe* both premiered in 2005.

[4] The James Randi Educational Foundation was incorporated in Delaware on February 29, 1996, and the creation of the new organization was officially announced on April 3, 1996. Randi, James. "The Foundation." http://randi.org/hotline/1996/0035.html (Accessed November 2, 2012.)

[5] Historian Michael Shermer became inspired to pursue skepticism at a Carl Sagan lecture in 1987. Shermer, Michael. "An Awful Hole, a Wonderful Life." *Skeptic.* Vol. 4, No. 4, 1996. p. 13. In 1991, he met with artist Pat Linse, who had been involved with a previous, defunct group (the Southern California Skeptics) and they decided to create a new group. The Skeptics Society held its first lecture in March 1992. Shermer, Michael. "Let Us Reflect: Thoughtful Inquiry on Twenty-Five Years of Skepticism." *The Skeptic Encyclopedia of Pseudoscience*, Michael Shermer and Pat Linse, Eds. (Santa Barbara, California: ABC-CLIO, 2002.) pp. 864–865. The first issue of *Skeptic* magazine appeared in Spring 1992.

[6] *Skeptic* Vol. 1, No. 4 appeared on newsstands of "over 5000 retail outlets across America" in late 1992. "Skeptic now in Bookstores." Skeptic. Skeptic. Vol. 1, No. 4, 1992. p. 13. If I understand correctly, the previously subscription-only *Skeptical Inquirer* also appeared on newsstands for the first time during the same Winter 1992-1993 period, with an initially modest newsstand circulation growing "from 1,633 copies of Winter 1992 to 3,200 of Winter 1993." Frazier, Kendrick. "Look for SI in Bookstores." *Skeptical Inquirer.* Vol. 17, No. 2. Winter 1993. p. 125. I'm happy to say that both periodicals are widely sold and widely enjoyed today.

[7] CSICOP was predated by narrower, topic-specific groups with skeptical missions. As well, there are some fine points to consider regarding the formation of CSICOP itself. CSICOP was built on top of an earlier ad hoc group created by Ray Hyman, Martin Gardner, and James Randi around 1973 (apparently with some input from Leon Jaroff). Jaroff recalled [1a] that the notion that "[s]ome sort of organization was needed…to counter the wave of irrationality" arose over lunch in Manhattan "a week after" Uri Geller appeared on *The Tonight Show with Johnny Carson* on August 1, 1973. Hyman confirmed [1b] by email, "We did have the meeting with Jaroff in New York that Leon described." However, he recalled both by email in 2012 and in print in 1998 [1c] that the original ad hoc group was formed following a visit with James Randi in Portland, Oregon while Randi was on tour with Alice Cooper (also in 1973 [1d]): "As a result of this conversation [in Portland], Randi, Martin Gardner and I formed an informal group called SIR—Scientists in Rationality—an obvious play on the Stanford Research Institute. We started holding informal meetings, like at Martin's house, but none of us are administrators so there was a lot of talking but not much action." In a 2012 interview, however, Hyman recalled [1e] that SIR was instead an acronym for "Sanity In Research." By 1975, sociologist Marcello Truzzi had joined this informal group, which was subsequently identified in print [1f] by yet a third name: RSEP, or Resources for the Scientific Evaluation of the Paranormal. RSEP was said in that news item to be made up of Gardner, Hyman, Randi, and Truzzi. Hyman confirmed by email [1b] that SIR and RSEP were the same ad hoc group, saying "I do recall Leon suggesting an alternative name such as RSEP." After a meeting between Truzzi and philosopher Paul Kurtz, this informal group was expanded and formalized in 1976 as a new organization called CSICOP. As RSEP (aka SIR) was a small, fledgling, ad hoc group, its replacement CSICOP is usually described as the "first North American skeptical organization." This is fair as shorthand. Certainly it is the case that CSICOP was the first *substantial* North American organization of the contemporary period organized around the full range of skeptical topics. See [1a] Jaroff, Leon. "The Magician and the Think Tank." *Skeptical Odysseys*, Paul Kurtz ed. (Amherst, New York: Prometheus Books, 2001.) p. 99; [1b] Ray Hyman email to author, October 23, 2012; [1c] Shermer, Michael. "The Truth is Out There & Ray Hyman Wants to Find It: An Interview with a Co-Founder of Modern Skepticism." *Skeptic*. Vol. 6, No. 2, 1998. p. 94; [1d] Ruggieri, Melissa. "Alice Cooper reminisces at Dragon-Con." Atlanta Music Scene. August 31, 2012. http://blogs.ajc.com/atlanta-music-scene/2012/08/31/alice-cooper-reminisces-at-dragon-con/ (Accessed October 24, 2012); [1e] Clint, Edward. "Skeptic Legend: Interview with Ray Hyman." Skeptic Ink, Oct 18, 2012. http://skepticink.com/incredulous/2012/10/18/rayhyman/ (Accessed Oct 21, 2012); [1f] "New Association to Study ESP." *Parapsychology Review,* July–August 1975. Vol.6, No.4. p. 8

[8] As Michael Shermer put it in his remembrance for the late philosopher, "everyone I have spoken to (including the other founders) agrees that it was Paul Kurtz more than anyone else who actually made it happen. All successful social movements have someone who has the organizational skills and social intelligence to get things done. Paul Kurtz is that man." Shermer, Michael. "Paul Kurtz & the Virtue of Skepticism: How a Thoughtful, Inquiring, Watchman Provided a Mark to Aim at." *eSkeptic,* October 24th, 2012. http://www.skeptic.com/eskeptic/12-10-24/ (Accessed October 24, 2012.)

[9] Founding CSICOP members included—among others—philosopher Paul Kurtz; science popularizer Martin Gardner; astronomer Carl Sagan; psychologists Ray Hyman and James Alcock; journalists Philip J. Klass and Leon Jaroff, science fiction authors L. Sprague de Camp and Isaac Asimov, sociologist Marcello Truzzi, and magician James Randi. Because CSICOP emerged over two to five years from an ad hoc group, the speaker lineup from an annual convention of the American Humanist Association, and the first few issues of an experimental magazine, retrospective lists of "founding members" vary. There are quite a few names to draw upon. Paul Kurtz noted in 1976 that at its official founding (May 1, 1976) CSICOP "had as its sponsoring members some twenty-five scientists, authors, and scholars." Kurtz, Paul. "The Aims of the Committee for the Scientific Investigation of Claims of the Paranormal." *The Zetetic*. Vol. 1, No. 1. Fall/Winter, 1976. p. 6. A CSI press release in 2010 put the number at "approximately 40 original founding Fellows…." http://www.csicop.org/news/press_releases/show/sixteen_notable_figures_in_science_and_skepticism_elected_csi_fellows (Accessed October 23, 2012). See also for example Frazier, Kendrick. "L. Sprague de Camp: Erudite Writer on Archaeology, Ancient Engineering, and Pseudoscience (and Science Fiction Too)." Skeptical Inquirer. Vol. 25, No. 2. March–April, 2001. p. 6–7; "Fellows of the Committee" list on back cover of The Zetetic. Vol. 1, No. 1. Fall/Winter, 1976.

[10] CSICOP founders and other early skeptics have often expressed surprise that their small organization with its idiosyncratic concerns swiftly spawned an international movement. According to Paul Kurtz, for example, "this was totally unexpected: immediately after forming CSICOP, many concerned scientists and skeptics said that they wanted to establish similar local groups in their areas in the United States. Similarly, researchers in other countries said that they wished to do the same. Thus skeptical organizations began forming throughout the world." Kurtz, Paul. "Introduction." *Skeptical Odysseys*, Paul Kurtz, Ed. (Amherst, New York: Prometheus Books, 2001.) pp. 16–17. Henry Gordon likewise observed, "There has been one unforeseen development. Local groups inspired by CSICOP have sprung up all over the continent. They've been monitoring their own areas, checking on irrational claims, putting out their own publications and newsletters—providing a public service."
—Gordon, Henry. *Extrasensory Deception.* (Macmillan: Toronto, 1988.) pp. 217-218

[11] First published in 1952 under the title *In the Name of Science;* retitled *Fads & Fallacies in the Name of Science* for the second and subsequent editions.

[12] Randi, James. *Flim-Flam!* (Amherst, New York: Prometheus Books, 1982.) pp. 252

[13] Gordon was the skeptical voice for "close to 550" media appearances in addition to his newspaper columns and books. Gordon, Henry. "Diary of a Canadian Debunker." *Skeptical Odysseys,* Paul Kurtz, Ed. (Amherst, New York: Prometheus Books, 2001.) pp. 233–242

[14] For example, the Lehigh Valley Committee Against Health Fraud, Inc., known today as Quackwatch, was organized in 1969 and incorporated by physician Stephen Barrett in 1970. Herbert, Victor and Stephen Barrett. *Vitamins & Health Foods: The Great American Hustle.* (Philadelphia: George F. Stickley Company, 1985.) Copyright page; "NCAHF's History." June 25, 2001. http://www.ncahf.org/about/history.html (Accessed November 1, 2012). (See also endnote 58.)

[15] The historical record regarding the Occult Investigation Committee is unclear, and the Society of American Magicians did not respond to my requests for information. However, it seems that it was established around 1931, inspired by the debunking work of Harry Houdini (which had been cut short by his unexpected death in 1926). Magician and newspaper man Julien Proskauer wrote, "When the Parent Assembly of the Society of American Magicians…decided to start a campaign against fake spirit mediums, fortunetellers, and others claiming supernatural powers, I was appointed chairman of its committee." Proskauer, Julien F. *The Dead Do Not Talk*. (New York: Harper & Brothers Publishers, 1946). p. xiii. The OIC seems to have enjoyed an initial burst of energy under Proskauer, and then another in the early 1970s under Milbourne Christopher (who went on to become a founding fellow of CSICOP in 1976).

[16] Skeptical activists Joseph F. Rinn, W. S. Davis, James L. Kellogg and "a few hundred members, mostly interested in exposing fakers" formed the Metropolitan Psychical Society in 1905 as a reaction to the unwillingness of the New York's Society for Psychical Research to engage critically with fraudulent paranormal claims. Rinn, Joseph. Sixty Years of Psychical Research. (The Truth Seeker Company, 1950.) pp. 222-223, 265

[17] Dommanget, Jean. Letter to the editor. "True Origins of CSICOP." *Skeptic.* Vol. 6, No. 4. 1998. p. 21

[18] The decision to create Le Comité Belge pour l'Investigation Scientifique des Phénomènes Réputés Paranormaux (or Comité Para for short) was made on January 15, 1949. The organization was officially registered as a nonprofit organization on June 4, 1949. Dommanget, Jean. "Guest Column: The Comite Para—A European Skeptics Committee." *Journal of Scientific Exploration*, Vol. 7, No. 3. 1993. p. 318

[19] As the organization's current head explained, "One of the first important research projects carried out by our committee took place in 1952 as a reaction to the unacceptable extension of the activity of the radiesthesists [people who claim to detect and work with otherwise undetectable paranormal radiation; often, pendulum dowsers] into proposing to families of people who had disappeared during the war to provide information about the situation of parents. A few honest radiesthesists, genuinely believing in their abilities, were unfortunately surrounded by a great majority of 'quacks.' Legal authorities found themselves involved and concerned…." This led to a formal test of the abilities of 30 radiesthesists to locate volunteers on a map and determine if those volunteers were alive or dead. "The results were the same as would be expected by chance, and were published in 1953 under the title: 'Une experience radiesthesique de recherche de disparus.'" Dommanget. (1993.) p. 318; see also Dommanget, Jean. "Le discours du Président Jean Dommanget." http://www.comitepara.be/cinquantenaire/index.html#bv000001 (Accessed October 23, 2012);

[20] Mackenberg, Rose, as told to Joseph Fulling Fishman. "I've Unmasked aThousand Frauds." *Saturday Evening Post.* March 3, 1951. pp. 26–105

[21] Often these complaints come from outside critics who fail to see the point of skeptical research. At other times, skeptics—even architects of the skeptical movement—become bored or disillusioned with that work. In 2012, for example, paranormal investigator Benjamin Radford recalled for that this was the case with CSICOP organizer Paul Kurtz: "[O]n more than one occasion (in fact dozens of times) he told me 'there's no interest in the paranormal,' which seemed to suggest that *Skeptical Inquirer* had no purpose-or that nobody was watching all those high-rated paranormal cable TV shows." Radford, Benjamin. "Memories of Paul Kurtz." CFI Blogs. http://www.centerforinquiry.net/blogs/entry/memories_of_paul_kurtz/ (Accessed October 27, 2012)

[22] Hering (1924.) p. 3

[23] Loxton, Daniel. "Where Do We Go From Here?" (Skeptics Society, 2007.) http://www.skeptic.com/downloads/WhereDoWeGoFromHere.pdf

[24] For example, Martin Gardner's 1957 *Fads and Fallacies in the Name of Science* cited older work by both Daniel Hering and Joseph Jastrow; Hering's 1924 *Foibles and Fallacies of Science* referred back to the 1911 *Nostrums and Quackery* by the American Medical Association, and other sources—and so on. D.H. Rawcliffe viewed his 1959 *Illusions and Delusions of the Supernatural and Occult* as the successor to older skeptical work, saying, "It is over forty years since Podmore, Jastrow, and Lloyd-Tuckett published their volumes dealing with the fallacies underlying psychical research, and since then no major work has appeared which can be regarded as their successor in this field. The present work may be regarded as an attempt to fill the vacuum." See for example Gardner, Martin. *Fads and Fallacies in the Name of Science.* (New York: Dover Publications, 1957.) p. viii; Hering (1924.) p. 258

[25] For a survey of the wider topic of philosophical doubt, check out *Doubt: A History: The Great Doubters and Their Legacy of Innovation from Socrates and Jesus to Thomas Jefferson and Emily Dickenson*, by Jennifer Michael Hecht (New York: HarperCollins, 2004)

[26] Historians are justifiably leery of the distorting effects of attempts to fit figures of the past into the context of modern movements. For example, consider the first warning expressed by Rebekah Higgitt (Curator and historian of science at the Royal Observatory Greenwich & National Maritime Museum) in her blog post on the "Dos and don'ts" of the history of science: "Do not *ever* call anyone a scientist who would not have recognised the term. The word…was not actually used until the 1870s. If we use the term to describe anyone before this date we risk loading their views, status, career, ambitions and work with associations that just do not exist before this date." Nonetheless, for the purposes of this informal glance back, I will cite thinkers of the past as roots for an evolving "tradition" we *now* call scientific skepticism. I think this perspective can usefully inform modern skeptics about a basic fact—that science-informed attempts to dispel popular misconceptions predate 1976—but please do note that this backward-looking viewpoint calls for caution. The sources mentioned here do not fall in an unbroken progression (though in many cases they do refer to one another); most predate the concept of a "skeptical movement"; and, many of these authors had other concerns that would be unusual to find expressed by skeptics today (such as David Meredith Reese's attempt to debunk the anti-slavery abolitionist movement). For more on this topic, see Higgitt, Rebekah. "Dos and don'ts in history of science." April 17, 2011. http://teleskopos.wordpress.com/2011/04/17/dos-and-donts-in-history-of-science/ (Accessed September 7, 2011)

[27] She wrote many excellent articles herself, but she was perhaps best known as the expert source behind Worden, Helen. "Exposing Tricks of the Fake Mediums." *Popular Science.* Vol. 145, No. 5. November 1944. pp. 67–214. She also wrote an unpublished book, entitled *So You Want to Attend a Seance?* This book exists only in manuscript form, however, and is in private hands. As of this writing, it is not available for research purposes. Helene Downes email to author, January 14, 2013

[28] Abbott was a magician who, incidentally, invented the original version of the animated ball routine performed today by Teller, another skeptical magician. Teller. "Teller Reveals His Secrets." *Smithsonian Magazine.* March 2012. http://www.smithsonianmag.com/arts-culture/Teller-Reveals-His-Secrets.html (Accessed November 27, 2012.)

[29] Price, George R. "Science and the Supernatural." *Science*, Vol. 122, No. 3165. August 1955. pp. 359–367

[30] This fairly common idea was raised rhetorically and discussed in Dacey, Austin. "The Skeptical Canon." July 26, 2011. http://www.csicop.org/specialarticles/show/the_skeptical_canon (Accessed August 1, 2011). Dacey went on to effectively refute this suggestion in part two of his essay, arguing (with reference to my own work) that scientific skeptics have a unique and useful expertise in fringe claims that are neglected by other scholarship. http://www.csicop.org/specialarticles/show/the_skeptical_canon_part_2/ (Accessed August 31, 2012)

[31] Rawcliffe, D.H. *Illusions and Delusions of the Supernatural and Occult.* (Dover: New York, 1959.) p. 18

[32]Ibid. p. 371

[33] This is the title of the 1962 Dover reprint, which I am drawing upon for this article; the book was originally published in 1935 under the title *Wish and Wisdom, Episodes in the Vagaries of Belief.*

[34] In addition to his earlier skeptical book *Fact and Fable in Psychology,* Jastrow for example joined New York skeptical activists Winfield S. Davis, James L. Kellogg, and John W. Sargent in 1910 in a successful plan to expose spirit medium Eusapia Palladino during a séance. Rinn. (1950.) pp. 278–281

[35] As an aside: Jastrow also popularized the famous "duck-rabbit" illusion.

[36] Jastrow, Joseph. Letter to the Editor. *The New York Times.* June 9, 1935. pg. BR20

[37] Jastrow, Joseph. *Error and Eccentricity in Human Belief.* (Dover Publications: New York, 1962.) p. 230

[38] Ibid. p. 339

[39] For a quick sense of this scene, see for example, Loxton, Daniel. "The Remarkable Mr. Rinn." *eSkeptic.* January 30th, 2013. http://www.skeptic.com/eskeptic/13-01-30/ (Accessed February 1, 2013). For a detailed treatment, see Rinn (1950)

[40] Houdini, Harry. *A Magician Among the Spirits.* (Fredonia Books: Amsterdam, 2002.) p. xiv

[41] See Loxton, Daniel. "Ghostbuster Girls." *Skeptic* Vol 18, No. 1. 2013. (In print)

[42] For a fascinating book-length discussion of the roles of skepticism and pseudoscience in science's nineteenth century boundary disputes, see Lyons, Sherrie Lynne. *Species, Serpents, Spirits, and Skulls: Science in the Margins in the Victorian Age.* (Albany, New York: State University of New York Press, 2009.)

[43] Lee, Henry. Sea Monsters Unmasked. (London: William Clowes and Sons, 1883.); Lee, Henry. *Sea Fables Explained.* (London: William Clowes and Sons, 1883.)

[44] Evans occupied a somewhat complicated position, concluding, "While the majority of mediumistic manifestations are due to conjuring, there is a class of cases not ascribable to trickery, namely, those coming within the domain of psychic force…. I am convinced that the recently annunciated law of telepathy will account for them. I discredit the theory of spirit intervention." Telepathy was at that time a more plausible "rational" explanation than history has shown it to be, and was actually quite a popular hypothesis among debunkers of Spiritualism. See Evans, Henry Ridgely. *Hours with the Ghosts, or, Nineteenth Century Witchcraft.* (Chicago: Laird & Lee, Publishers, 1897.) p. 207

[45] Owen, Richard. *The Times* (of London). "The Sea Serpent." Nov 14, 1848. p. 8

[46] See Lyons. (2009.) p.131; Milner, Richard. "Charles Darwin and Associates, Ghostbusters." *Scientific American*. October 1996. pp. 96–101; Shermer, Michael. "A Heretic-Scientist Among the Spiritualists: Alfred Russel Wallace and 19th Century Spiritualism—Part I." *Skeptic*. Vol. 3, No. 1, c. 1995. pp. 70–83

[47] Milner. (1996.) p. 99

[48] Huxley, Thomas Henry. The Week's News (London). October 21, 1871. p. 1316

[49] Shermer. (2002.) pp. 861

[50] Huxley, Thomas Henry. Spiritualism Unmasked. *Pall Mall Gazette*. No. 7423, Vol. XLIX. (January 1, 1889) pp. 1–2

[51] Craft, Amos N. *Epidemic Delusions: Exposé of the Superstitions and Frauds Which Underlie Some Ancient and Modern Delusions*. (Cincinnati. Walden and Stowe, 1881.) p. 19

[52] Ibid. p. 10

[53] Ibid. p. 80

[54] Ibid. 106

[55] Barnum, P.T. *Humbugs of the World*. (New York: Carleton Publisher, 1865.) p. 4

[56] Ibid. p. 220

[57] For more on JREF's challenge, visit http://www.randi.org/site/index.php/1m-challenge.html (Accessed August 1, 2011)

[58] Craft. (1881.) p. 80; Rinn. (1950.) p. 368; "Houdini Hurls Defi [sic] at Mediums Here: Escape Artist Offers $10,000 for Demonstration at Committee Hearing." *The Washington Post*. May 21, 1926. p.9

[59] Barnum. (1865.) p. 60

[60] Even in the context of modern skeptical organizing in the United States, medical quackery has been a key issue since the beginning. Several dedicated watchdog groups were formed by interested medical doctors during the 1970s and '80s. For example, the Lehigh Valley Committee Against Health Fraud, Inc. was incorporated in 1970. The Southern California Council Against Health Fraud was established in 1977. The California Council Against Health Fraud was formed in 1978, and then renamed the National Council Against Health Fraud in 1984. (During the 1998 through 2000 period, the NCAHF also "conducted some of its business" under the name "National Council for Reliable Health Information," but it continues as the National Council Against Health Fraud today.) See "NCAHF's History." June 25, 2001. http://www.ncahf.org/about/history.html (Accessed November 1, 2012). These activist "quackbusting" doctors, including Stephen Barrett, William Jarvis, and Wallace Sampson, were also involved with the early days of the broader skeptical movement, contributing to the *Skeptical Inquirer* and speaking at early CSICOP events. All three were among the founding members of CSICOP's Paranormal Health Claims Subcommittee, the formation of which was announced in winter 1980–81. Kurtz, Paul. "CSICOP establishes a new Paranormal Health Claims Subcommittee." *Skeptical Inquirer.* Vol. 5, No. 2. Winter, 1980-81. pp. 11–12. For its part, the Skeptics Society identified medical claims as a key area within its mandate upon its formation in 1992. "About the Skeptics Society." *Skeptic.* Vol.1, No. 1. 1992. p. 50

[61] Improving upon previous designs, Holmes designed and popularized a new "American" style of stereoscopic viewer, ushering in a long-lasting and widespread craze for stereoscopic photography. See for example, Fraprie, Frank R. and Walter E. Woodbury. *Photographic Amusements: Including Tricks and Unusual or Novel Effects Obtainable with the Camera.* (Boston: American Photographic Publishing Co., 1931.) p. 182

[62] Holmes, Sr., Oliver Wendell. "Homeopathy and Its Kindred Delusions: Two lectures delivered before the Boston Society for the Diffusion of Useful Knowledge, 1842." *Medical Essays.* (BiblioBazaar: 2007.) p. 42

[63] Holmes. (2007.) pp. 21–22

[64] Sagan, Carl. "Night Walkers and Mystery Mongers: Sense and Nonsense At the Edge of Science." *Skeptical Inquirer.* Vol. 10. Spring, 1986. p. 220

[65] Reese, David Meredith. *Humbugs of New York: being a remonstrance against popular delusion.* (New York: 1838.) p. 14–15

[66] Ibid. p. 15

[67] "Rapport Des Commissaires chargés par le Roi, de l'Examen du Magnétisme animal." *Skeptic,* Vol. 4, No. 3, 1996. pp. 68–83. Includes the entire text of the report prepared by Franklin, Lavoisier, and the other Commissioners. Also reprinted in *eSkeptic*, September 22nd, 2010, available online at http://www.skeptic.com/eskeptic/10-09-22/#feature (Accessed August 14, 2011)

[68] Ibid. p. 68

[69] Ibid. p. 71

[70] Ibid. p. 70

[71] Ibid. p. 70

[72] Ibid. p. 71

[73] Ibid. p. 74

[74] Ibid. p.

[75] Shermer, Michael. "The First Scientific Investigation of the Paranormal Ever Conducted: Testing the Claims of Mesmerism" *Skeptic*, Vol. 4, No. 3, 1996. pp. 66–67.

[76] See for example Shermer (1998); Shermer (1996); Shermer (1995); Shermer, Michael. "The Annotated Gardner: An Interview with Martin Gardner—Founder of the Modern Skeptical Movement." *Skeptic*. Vol. 5, No. 2. 1997. p. 56–61;

[77] Browne, Thomas. *Pseudodoxia Epidemica: or Enquiries into Commonly Presumed Truths*. 1672. (Benediction Classics: Oxford, 2009.) p. 16

[78] Ibid. p. 100

[79] Ibid. p. 24

[80] Ady, Thomas. *A Candle in the Dark*. (London: Printed for Robert Ibbitson, 1655.) p. 99. Please note that I've modernized the spelling and typesetting in this and other Ady quotes for the purposes of readability.

[81] Ibid. pp. 100–101

[82] Ibid, pp. 124–125

[83] Ibid, p. 125

[84] Ibid, p. 17

[85] Ibid, p. 16

[86] Ibid, pp. 32–33

[87] Ibid. p. 34

[88] Ibid, p. 40

[89] Michael de Montaigne. Charles Cotton, trans. *Essays of Michael Montaigne*. (1877.) Chapter XI. Available online at Project Gutenberg. http://www.gutenberg.org/files/3600/3600-h/3600-h.htm (Accessed August 15, 2011)

[90] Ibid. Chapter XXVI.

[91] Told that the statue of the god Bel comes alive each night to consume the offerings of food and wine, the prophet Daniel suspects a trick. He arranges to seal the temple for a test, and then secretly scatters the floor with ashes. The next morning, Daniel and the king break the seals, and see that the offerings have been eaten. "But Daniel laughed and kept the king from entering. He said, 'Look at the floor and consider whose footprints these are.' 'I see the footprints of men, women, and children!' said the king. In his wrath the king arrested the priests, their wives, and their children. They showed him the secret door by which they used to enter to consume what was on the table." See the Book of Daniel, 14:1-22

[92] Lucian, A. M. Harmon, trans. *Lucian*. Vol IV. (London: William Heinemann, 1961)

[93] Moore, Steve. "Snake or Fake?" *Fortean Times.* June 2011. http://www.forteantimes.com/features/articles/5614/snake_or_fake.html (Accessed September 7, 2012)

[94] Lucian (1961) pp. 201–203

[95] Joe Nickell. "Undercover Among the Spirits: Investigating Camp Chesterfield." *Skeptical Inquirer,* Vol. 26, No. 2. March/April 2002. p. 24

[96] Lucian (1961) pp. 243-245

[97] Clay, Diskin. "Lucian of Samosata, Four Philosophical Lives (Nigrinus, Demonax, Peregrinus, Alexander Pseudomantis)." *Aufstieg und Niedergang der Römischen Welt.* 2.36.5. p. 3408

[98] Lucian (1961) p. 253

[99] Epicureanism seems perhaps to have been a common thread. Lucian and his skeptical colleague Celsus were both admirers of Epicurus. Another debunker who confronted Alexander about some psychic detective-type proclamations, which had sent several people to death for the murder of a young man who turned out still to be alive, was an Epicurean. Epicureans in general seem to have been hostile to Alexander. "When at last many sensible men, recovering, as it were, from profound intoxication, combined against him, especially all the followers of Epicurus, and when in the cities they began gradually to detect all the trickery and buncombe of the show," according to Lucian, a state of open ideological warfare emerged between the Epicureans and Alexander's followers, with each group denouncing the other. Lucian considered this animosity natural, saying "Upon whom else would a quack who loved humbug and bitterly hated truth more fittingly make war than upon Epicurus, who discerned the nature of things and alone knew the truth in them? The followers of Plato and Chrysippus and Pythagoras were his friends…but 'the impervious Epicurus'—what he called him—was rightly his bitter enemy, since he considered all that sort of thing a laughing-matter and a joke." Lucian (1961) p. 209, 231–233, 253

[100] Lucian (1961) p. 205

[101] "About American Atheists." http://www.atheists.org/about (Accessed July 28, 2011)

[102] "History of the Free Congregation of Sauk County: The 'Freethinkers' Story." http://www.freecongregation.org/history/freethinkers-story/ (Accessed July 28, 2011)

[103] That event was the 1976 annual American Humanist Association conference, titled "The New Irrationalisms: Antiscience and Pseudoscience." It took place in Buffalo, New York, April 30–May 1, 1976. Frazier, Kendrick. "From the Editor's Seat: Thoughts on Science and Skepticism in the Twenty-First Century (Part One)." *Skeptical Inquirer* Vol. 25, No. 3. May/June, 2001. pp. 46–47. See also Kendrick Frazier's history of CSICOP, which was published originally in *The Encyclopedia of the Paranormal*, edited by Gordon Stein (Amherst, New York: Prometheus books, 1996). Frazier was kind enough to provide me with a copy for the research of this article, but his piece has since been made available online: Frazier, Kendrick. "Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP)." 1996. http://www.csicop.org/about/csicop/ (Accessed February 12, 2013)

[104] Kurtz, Paul. "Introduction." *Skeptical Odysseys*, Paul Kurtz ed. (Amherst, New York: Prometheus Books, 2001.) pp. 15–16

[105] For an excellent overview, see Paul, Richard. "The Critical Thinking Movement: 1970–1997: Putting the 1997 Conference into Historical Perspective." Criticalthinking.org. http://www.criticalthinking.org/articles/documenting-history.cfm (Accessed August 15, 2011)

[106] Frazier, Kendrick. "From the Editor's Seat: Thoughts on Science and Skepticism in the Twenty-First Century (Part Two)." *Skeptical Inquirer* Vol. 25, No. 4. July/August, 2001. p. 50

[107] Kurtz, Paul. "A Quarter Century of Skeptical Inquiry: My Personal Involvement." *Skeptical Inquirer*, Vol. 25, No. 4. July/August, 2001. p. 42

[108] Truzzi, Marcello. *The Zetetic*. Vol. 1, No. 1. Fall/Winter, 1976. pp. 5–6

[109] Kurtz. (1976.) pp. 6–7

[110] Coleman, Loren. "Is 'Scoftic' a Useful Term?" Cryptomundo.com. April 28, 2007. http://www.cryptomundo.com/cryptozoo-news/scoftic/ (Accessed Aug 15, 2011)

[111] Kurtz, Paul. "The Responsibilities of the Media and Paranormal Claims." *Skeptical Inquirer.* Vol. XI, No. 4. 1985. p. 360

[112] Or like assholes. The "noses" version of this sentiment appears to predate the other, however.

[113] There was always a dissenting minority who felt that skepticism should be "widened" to tackle metaphysical claims in order to open a broader range of fire against religion, just as there are biologists who reject evolution, but this minority was traditionally very small. As folklorist Stephanie Hall found in 1999, "Most local groups now state, informally or formally, that the belief or disbelief in God is not an issue appropriate to their forum." Hall, Stephanie A. "Folklore and the Rise of Moderation Among Organized Skeptics." *New Directions in Folklore* 4.1: March, 2000. http://www.temple.edu/english/isllc/newfolk/skeptics.html (Accessed May 26, 2011)

[114] Shermer, Michael. "About the Skeptics Society." *Skeptic.* Vol.1, No. 1. 1992. p. 50

[115] Shermer, Michael. *How We Believe.* (New York: W.H. Freeman/Owl, 2003.) pp. xiii–xv

[116] A word here about language. When "scientific skeptics" defend a scope of "testable claims," these terms are shorthand. This a matter of disambiguation: what we mean is that unlike other forms of rational doubt, scientific skepticism is grounded in empiricism and informed by science. We're after evidence; therefore, we are limited to questions on which evidence is possible, at least in principle. When we speak of "testable claims," we do not mean we only care about questions that can tested by direct laboratory experiment (not even mainstream science is limited to experiments) but questions that are investigable through *any* empirical means.

[117] Novella, Steven and David Bloomberg. "Scientific Skepticism, CSICOP, and the Local Groups." *Skeptical Inquirer*, Vol. 23, No. 4. July/Aug 1999. pp. 44–46

[118] Novella, Steven. "Skepticism and Religion—Again." Neurologica. April 6, 2010. http://theness.com/neurologicablog/index.php/skepticism-and-religion-again/ (Accessed Aug 15, 2010)

[119] The accusation that the testable claims criterion is secretly intended to "coddle" religion is very common across the atheist blogosphere. For a specific response to Novella's thoughts (cited above), see the (as of this writing) 230 comments following his post. For example, one commenter argued that the whole demarcation question arrises because "Skeptics are afraid to be seen criticising religion because religion is pervasive in the US," to which Novella responded, "my position is NOT due to fear of pissing off the religious. It is a philosophical position that I have defended extensively. If you listen to the SGU and read this blog, it should be clear that I have no fears of pissing off huge segments of the population." http://theness.com/neurologicablog/index.php/skepticism-and-religion-again/#comment-19298 (Accessed August 18, 2011)

[120] Swiss, Jamy Ian. "Overlapping Magisteria." Speech delivered at The Amazing Meeting 2012. As posted on YouTube https://www.youtube.com/watch?v=DIiznLE5Xno (Accessed August 31, 2012)

[121] Shermer. (2003.) p. xiv

[122] Randi, James. *The Faith Healers.* (Buffalo, New York: Prometheus Books, 1987.) p. 146

[123] Steiner, Robert. "Exposing the Faith-Healers." *Skeptical Inquirer.* Vol. 11, No. 1. (Fall 1986.) pp. 28–29

[124] Randi. (1987.) p. 146

[125] Shaw was also one of the "Alpha Kids" who, under Randi's direction, misled parapsychologists into the belief that Shaw and colleague Michael Edwards had genuine psychic powers. See Randi, James. "The Project Alpha Experiment: Part 1. The First Two Years." *Skeptical Inquirer.* Vol. VII, No. 4. Summer 1983. pp. 24–33 and Randi, James. "The Project Alpha Experiment: Part 2: Beyond the Laboratory." *Skeptical Inquirer*. Vol. VIII, No. 1. Fall 1983. pp. 36–45

[126] Randi. (1987.) p. 147

[127] Randi. (1987.) pp. 147–148; Steiner. (1986.) p. 29

[128] Inside Edition. Feb 2007. As posted on Google Videos. http://video.google.com/videoplay?docid=-3999472423311387509 (Accessed September 10, 2011)

[129] Shermer, Michael. "God, ET, and the Supernatural." Skepticblog. November 6, 2012. http://www.skepticblog.org/2012/11/06/why-there-cannot-be-a-deity/ (Accessed November 6, 2012)

[130] Novella. (2010)

[131] Novella and Bloomberg. (1999)

[132] Shermer, Michael. "The Scope of Skepticism." *Skeptic.* Vol. 1, No. 4, 1992. pp. 10–11

[133] Kurtz, Paul. "New Directions for Skeptical Inquiry." Csicop.org. December 4, 2006 http://www.csicop.org/specialarticles/show/new_directions_for_skeptical_inquiry/ (Accessed July 28, 2011)

[134] Not surprisingly, Kurtz was aware of the practical limits. In 1999, he argued that while "Skeptical inquiry in principle should apply equally to economics, politics, ethics, and indeed to all fields of human interest," in practice "we cannot possibly evaluate each and every claim to truth that arises." Kurtz, Paul. "Should Skeptical Inquiry Be Applied to Religion?" *Skeptical Inquirer,* Vol. 23, No. 4. July/Aug 1999. pp. 24–28

[135] Browne, Thomas. (2009.) p. 36

[136] Copernicus quote from the Preface of his *Revolutions*. http://www.webexhibits.org/calendars/year-text-Copernicus.html (Accessed Aug 2, 2011)

[137] Press release from SSA Public Relations dated March 1, 2006. Emailed to *Skeptic,* April 4, 2006. The comment I've quoted from the release may be a paraphrase of Mr. Adams, but I believe that it accurately describes his views. For more, see http://www.nealadams.com/nmu.html or listen to his interview on *Skeptics Guide to the Universe* podcast episode #51 http://media.libsyn.com/media/skepticsguide/skepticast2006-07-12.mp3 (Accessed August 2, 2011)

[138] Prothero, Donald. "The Linus Pauling Effect." Skepticblog.org. April 13, 2011. http://skepticblog.org/2011/04/13/the-linus-pauling-effect/ (Accessed August 2, 2011)

[139] Frazier. (2001) *Skeptical Inquirer* Vol. 25, No. 4. p. 50

[140] Hyman, Ray. "Proper Criticism." *Skeptical Inquirer.* Vol. 25, No. 4. July / August 2001. pp. 53–55

[141] Loxton, Daniel. "What, If Anything, Can Skeptics Say About Science?" Skepticblog.org. Dec 22, 2009. http://skepticblog.org/2009/12/22/what-if-anything-can-skeptics-say-about-science/ (Accessed August 2, 2011)

[142] Exploring outside his realm of specialization, James Randi ventured opinions in 2009 about climate change. He wrote in reference to a disreputable effort known as the Oregon Petition Project, "I strongly suspect that The Petition Project may be valid." This attracted considerable criticism. As Phil Plait responded, the Petition "was an attempt by global warming denialists to muddy the climate issue, and one that has been thoroughly trashed—it's really just as awful as the similarly ridiculous, and just as thoroughly nonsensical, attempt by the Discovery Institute to get a petition by scientists who doubt evolution." See Randi, James. "AGW Revisited." Swift. Randi.org. http://www.randi.org/site/index.php/swift-blog/805-agw-revisited.html (Accessed August 18, 2011) and Plait, Phil. "Randi, skepticism, and global warming." Bad Astronomy. Dec 17, 2009. http://blogs.discovermagazine.com/badastronomy/2009/12/17/randi-and-global-warming/ (Accessed August 18, 2011)

[143] Given the long duration, media attention, and intentional deception involved in Project Alpha, it is not surprising that there are competing interpretations of the events and ethics of the hoax. For interesting discussions of the case, see for example, Thalbourne, Michael. "Science Versus Showmanship: A History of the Randi Hoax." *The Journal of the American Society for Psychical Research* Vol. 89, October 1995. pp. 345–366; Gardner, Martin. "Lessons of a Landmark PK Hoax." *Science Confronts the Paranormal.* Kendrick Frazier, Ed. (Prometheus Books: New York, 1986. p. 166–169

[144] Randi, James. "The Project Alpha Experiment: Part 1. The First Two Years." *Skeptical Inquirer.* Vol. VII, No. 4. Summer 1983. pp. 24–33

[145] Hilts, Philip J. "Magicians Score a Hit on Scientific Researchers." *The Washington Post.* Mar 1, 1983. p. A1

[146] Dunninger, Joseph. *Inside the Medium's Cabinet.* (New York: David Kemp and Company, 1935.) pp. 7–15

[147] Ibid.

[148] "Magicians Evoke a 'Ghost' at Show." *The New York Times.* April 26, 1932. p. 9

[149] Radford, Benjamin. *Scientific Paranormal Investigation: How to Solve Unexplained Mysteries.* (Rhomus Publishing Company: Corrales, 2010.) pp. 19–20

[150] Ibid.

[151] Farley, Tim. "How much skeptical podcasting is being produced?" Skeptools.com. May 19, 2011. http://skeptools.com/2011/05/19/skeptical-podcasting-size-volume/ (Accessed August 18, 2011)

[152] Loxton. (2007)

[153] Frazier. (2001) *Skeptical Inquirer* Vol. 25, No. 3. p. 49

[154] Frazier. (2001) *Skeptical Inquirer* Vol. 25, No. 4. p. 48

[155] Loxton. (2007)

[156] L. Sprague de Camp. "The Uses of Credulity." *Skeptical Inquirer*, Vol. 10, Spring 1986. p. 217

[157] Loxton. (2007)

[158] Scott, Eugenie. "Bay Area Skeptics and Religion." http://www.baskeptics.org/node/155 July 29, 2011. (Accessed Sept 19, 2012)

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[161] See for example Randi, James. "The 'High-Tech' Dowsing Stick Meets the Irresistible Challenge." *Skeptic.* Vol. 4, No. 1. 1996. pp. 10–11; Randi, James. "The Matter of Dowsing…" *Skeptic*. Vol. 6, No. 4. 1998. pp. 6–7

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