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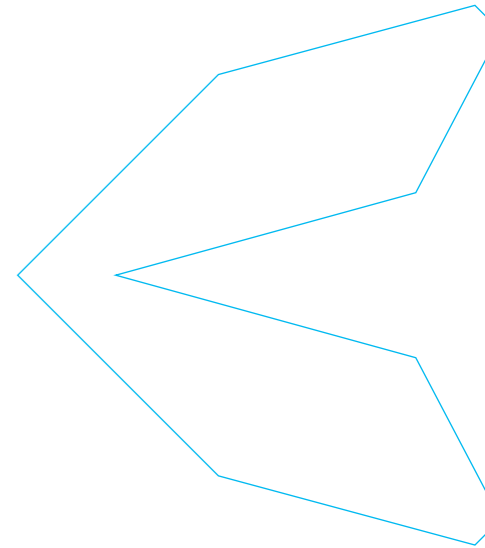
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GUEST EDITORIAL

# Journey to Credibility: 13 Rules for Maverick Scientists

**William J. Beaty**

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Some academic departments receive numerous papers submitted by so-called “crackpots.” Recently, I encountered quite a good example: one cleaned up for publication in professional literature. Ordinarily, such a submission would be discarded at the first mention of government conspiracy (its author described universal suppression of novel energy sources!) Clearly, they were unaware of the various taboos in science,<sup>1</sup> And this paper included a variety. One unwritten rule is Thou-Shalt-Not-Mention-Conspiracies, especially in a physics paper! (Really, do we need to be told this?) Worse, that was one of similar violations of many unwritten rules that we’re all supposed to learn early in our careers. This leads to a broad topic I find fascinating. WHAT ARE THESE UNWRITTEN RULES? I mean, besides the ban on ALL-CAPITALS SENTENCES, the ban on colored text, etc. Do ‘Guild secrets’ exist in the sciences? Any tricks of the trade? And within each edge-science field, how do we manage not to be crackpots? (What does Crackpot<sup>2</sup> even mean?) Also, how can the population of honest crackpots access the secret knowledge for genuine attempts to improve their submissions, even to the point where their work can pass initial review? My intended audience here is all those outside professional research.

If I successfully produce such a list, then besides improving the vast crackpot community, perhaps it might benefit the incoming new scholars or even a few of the pros. (In order to avoid becoming crackpots ourselves, we should recognize and avoid any listed behaviors.) I suspect I’m particularly suited to the task, having spent decades planting both feet firmly in both of these fields (quite the trick.) Readers can consider me a voice from out the crackpot realms: I’ve been there and returned with sanity intact (I think. Mostly.)

Note well that the following are personal observations only. Single data-points. DIY wisdom: nothing very solid. Also, I’m an engineer, and as an outsider, I may be able to perceive strategies/techniques that are useful to the “egregious non-scholars” who hope for journal publication. At the same time, I’ve found that such detailed examinations lend \*me\* new insights into the crackpot spectrum, as well as unique views on academic scholarship, of which I’d never previously been aware of. [Full disclosure: I’m only a “double-E” Research Engineer in academia, as well as a crackpot during my early decades.]

## SCIENCE BORDERS PSEUDOSCIENCE

First, how can we define “crackpot,” and divide the minority of legitimate frontier-researchers from the large population of non-scientist ‘True Believers?’ No method exists. Here I attempt only to list the common symptoms I’ve noticed.

In science, even in grade-school science fairs, the so-called ‘Demarcation Prob-

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lem' is an old issue. We attempt to divide Science from Non-science. The problem is famously unsolved. If we discover a reliable method to detect crackpots, we may be the next "Newtons" in Philosophy of Science.

One venerable approach was: if we don't follow "The Scientific Method" (TSM) ...are we not then exposed as pseudoscientists? Nope, wrong. Today, that doesn't work. "TSM" was shot down in 1989. [American Association for the Advancement of Science (AAAS, 1994)]. Apparently, the well-known recipe list of Hypothesis-Experiment-Conclusions, the list we all supposedly employ in performing Real Science, has been mutating at least since 1937 (McComas, 1996). After WW2, this list suddenly spread through grade-school textbooks as a galloping meme. (Notice that this list rejects Astronomy and Paleontology, etc. These Observational sciences have no controlled variables nor replicated experiments. I even encountered a K6-grade science fair that used TSM to reject astronomy projects as being non-science.) Fortunately, today, in American public schools, we teach the AAAS-approved "NOS," Nature of Science (AAAS, 1994). Creativity finally comes into the spotlight, and no mention is made of a universal "method." Yet, we still lack a way to mark the non-science.

At present, if someone loudly and publicly follows the recipe list "The Scientific Method" or berates others for not employing it, I see a significant chance that they're a crackpot. This constitutes a minor rule where, in our submitted papers, we crackpots must never mention, nor even hint at, "The Scientific Method." Methods of science exist, of course. But "TSM" was exposed as a grade-school myth.

## RULE NO. 1: ACADEMIC INTEGRITY

Is there a rule number one? If so, it's the following. To be accepted as a professional researcher, just be honest. Take extreme care never to fool the reader and never to fool anyone at all, not even a tiny bit, especially avoiding fooling yourself. Become rigorously honest, fanatically, and maniacally truth-telling while also being ruthlessly and brutally self-critical. Become your own worst skeptic. Adopt a stance of profound Academic Integrity, constantly employing a tentative approach while stripping out all traces of biased, non-neutral language from your writings. Then go further, cranking it up to eleven. That's the common everyday situation in professional research, and it is also expected in every one of our submitted papers.

All this is extremely important, so I'll repeat: it's all about coming clean, becoming utterly forthright, and completely up-front. Carefully avoiding persuasion techniques. Cultivating long habits of "full disclosure," telling

it like it is, revealing every embarrassing detail, with nothing left concealed. This includes specifically and intentionally exposing every minor aspect that *makes us look bad*. Strip off every small habitual false facade. (Heh, are we getting it yet?) We excise all traces of BS, no insinuations, no faking it, not even once, not even a tiny bit. Lies of omission are not to be tolerated, so we must go further than merely eliminating our everyday fibs and exaggerations, further than merely ensuring our "lack of dishonesty." Instead, adopt habits of fanatical, constant, and overt truth-telling. In other words, BE GENUINE.

I suggest that the amateurs who accomplish the above have journeyed most of the way to professional acceptance.

In his Caltech commencement-speech on Cargo-Cult pseudoscience (Feynman, 1974), physicist Richard Feynman named the above as a sort of "leaning-over-backwards honesty," noting that its lack provides a primary signature of the crackpot communities. He also noted that all doctoral candidates are expected to automatically internalize "scientific integrity", but without explicitly being taught. We somehow "catch on by osmosis."

This ruthlessly honest behavior marks the professional scientist.

And also, when distributed on the wide "spectrum of honesty," the majority of crackpots are located at the opposite end.

Why is honesty such an issue? To me, it appears simple. I'm convinced that without extremist honesty, scientists and crackpots would become identical, both trapped in the same state as the ancient alchemists, with entire scholarly communities dedicated to both misleading themselves as well as fooling any students under them.

The major part of today's crackpot community appears not only to lack the above "scientific integrity" and refuses to recognize its importance but also not to know what it is. We crackpots rarely build any deep honesty into any of our online works, such as our conference talks, our magazine publications, etc. Instead, we remain at the common level of honesty found in everyday life. (I.e., happily forgiving the constant fakes and distortions, even performing these ourselves, while also indulging in easy offhand BS-ing, if not outright lying.) I strongly agree with Feynman: lack of fanatical honesty provides a signature of crackpotism. Back when Science first learned scientific integrity, perhaps that was the moment when the secretive alchemists became the chemists of today.

One large issue here: In science, the usual level of honesty is completely unnatural. It's abnormal in humans and not easily acquired. (Also, should every trace of dishonest BS be banned from everyday use, business and politics might grind to a halt!) I've realized that young

kids quickly adopt business/political behaviors. If you're like me, your childhood included intense training in constant dishonesty. Fooling our siblings, fooling our parents, fooling our teachers. In my teen years, I discovered all the lies told earlier by parents, the lies taught during grade school, the huge amount in untrustworthy media, etc. If we lack siblings, then public school provides our first competitive political environment, necessarily ruled by a thousand tiny falsehoods.

As a quick illustration, during everyday life, try adopting a temporary habit of fanatical truth-telling. Try it for an hour, a day, a week. How long dare you continue? Next, do the same in your journal submissions. See the point?

*Science Ain't Business.* In other words, daily life is inherently "crackpot" and remains diametrically opposed to the role we adopt in professional research. Over many years, our early life skills were hammered into personal weapons/defenses against our numerous opponents, maintaining our false facades to prevent anyone from even guessing our intentions, much less using them against us. We learn ploys to escape ego damage and tricks to avoid remaining babes-in-the-woods. We habitually practice plausible deniability both on the surface and all the way down.

Science instead pursues a complete vulnerability, a surrender of weapons, and this appears to produce a sort of "artificial telepathy," where nothing is hidden or even can be. All our secrets are exposed to enemies. We intend to communicate with utter clarity, dropping our age-old human habits of misdirection and distortion, instead allowing critics and opponents to see and understand everything inside our heads. In addition, keeping silent while hoping for readers' mistakes is forbidden; no lies of omission. When we suspect even minor confusion on the part of our audience, we're required to immediately correct these.

With this, we've all left the highly secretive crackpot world behind. (I see that the various crackpot communities have yet to learn these tactics.)

## **RULE NO. 2: ZERO DECEPTION**

*Never Fake Nothin'!!!* Not even once. Not in your papers, not in your work, not in your life.

Obtaining a PhD from a mail-order degree-mill? That's one crackpot mistake I've watched play out. The person then passes faux-credibility all over their books and videos. Soon, they're exposed by critics. (This occurred in the 1980s. I'm uncertain whether today's online world has altered this ploy.) Perhaps Dr. Crackpot assumes that if/when they're eventually caught ...it's really no big deal, right? Wrong. In the research community, that sort of

thing triggers permanent doom. Those who fake things will find themselves everlastingly stamped as egregious non-scientists: never again to be trusted. In science, even slight dishonesty is the trademark of the lowest of the low. It's just not done. One little lie, even in an obscure, unimportant paper, and the whole deal is up. Nature cannot be fooled, and in the long term, neither can the research community.

Also, the concealed identities common to the online world are to be avoided: always use your real name for everything. Outsiders might never realize that fake identities label them as crackpots or at least mark them as unprofessional in the extreme. Instead, always behave with high integrity and allow the entire online world to easily discover any misbehavior.

There's another aspect of fakery I've encountered more than once. It arises when the news media insist that crackpots produce some anomalies on demand. When we find ourselves unable, then we see no reason to avoid deception. After all, the fake version looks just like the genuine anomaly (which perhaps has never been captured on film. No, I'm not thinking of Uri Geller.) Analogy: With a corporate product demonstration on display to investors, a malfunctioning device can be helped along with stage magic. (After all, we did have the device working earlier! Honest!) The same applies to every claimed crackpot invention. We're certain that it works; therefore, we deceive ourselves into accepting the need to deceive others. (One inventor privately admitted that when hostile, skeptical camera crews become too insistent, he takes revenge by providing very stupid and obvious fakes.) Yet, to me, this behavior marks both the ancient shamen as well as the modern crackpots. They mix their genuine miraculous discoveries with "close-in coin-tricks," thus keeping the onlookers guessing. They're fundamentally clueless regarding scientific integrity. As with any normal human, they're dishonest at their core, and so it doesn't matter much to them if their fakes are exposed. (And, all this may not only apply to those film crews: perhaps everything they've ever put on film has been fraudulent.)

Therefore, to escape from crackpotism, we want lots and lots of embarrassing mistakes and public failures, but not one small instance of deception.

## **RULE NO. 3: BE A SCHOLAR**

How can the science-outsiders see their work published? It's simple. Get a doctorate education from a good school and then just write any paper. No joke. Then, it flies right through the initial review process. Don't miss the fact that scientific literature is the channel for communication among professional scholars. That's its major

role. A journal is rarely a place for amateurs, not unless they're of the highly advanced kind.

But what is a "scholar?" Who makes the judgment call? (Who runs the Victorian school of social etiquette?) A conventional answer is that doctoral education is an obscure medieval process designed to convert poor, unsuspecting grad students into genuine, full-blown scholars. However, if that was the lone method, then we crackpots shouldn't bother submitting anything unless first we've put in the years, been through the grind, and received that magical piece of paper. Our Scientist-License. Yet the piece of paper isn't the real issue. (That's why cheating cannot help. Mail-order PhDs don't work.)

I must note that top experts exist who have no PhD, did no defense, never a grad student, yet absolutely qualify as the top in their field. (Freeman Dyson is the example I've encountered.) Perhaps we can all be like F.D. and attain the same Ph.D. status without receiving the actual doctorate? WWFDD? Can we genuinely perform everything required and attain our virtual "ABD" all-but-degree? Then, the greater community of scholars will intuitively recognize us as one of their own.

Of course, the point of the doctoral path isn't exclusivity. It's mostly there to provide needed support to the newbies. It allows us to gradually get on our feet as scholars. Learn the ropes of academic publishing while performing some practice runs outside the view of, and immune to, the crushing criticism from the wider intellectual community. During those brief years, in order to step into our new roles as professionals, *first, we must fake it*. But only performing in private. "Fake it til' you make it." We don't become professional scientists overnight. Instead, it's a gradual process of method-acting and stepping into a role. Then, over time, we identify with the role. It gradually takes us over. We acquire the "professional researcher" persona, then carefully test it out (again privately). Learn your role, memorize all your lines, go up on stage before your Committee. Perhaps mess up royally, and then it's back to the dressing rooms to try again.)

*If you say you're a scholar, you're not a scholar.  
You're only a scholar when OTHER scholars say  
you're a scholar. (Unknown)*

Crackpots typically know nothing about this entire topic. Also, we've never been through the process, and it makes a difference. We resemble fake MDs who have never experienced 24-hour rotations, no human dissections, and no hellish exam weeks. Then later, becoming quacks and attempting to fool the audience. Yet, to achieve the role of a scientist, we always begin with pure acting: "making a name" in some small field. Begin as temporary

personalities, always to be shed with lab coats at the exit door. How is this not a signature of pure crackpot fakery? To me, the difference involves the acquired honesty described above, plus long-term role identification. We don't become scientists; instead, "The Scholar" arrives and swallows up our original persona. I note that professionals must adopt a level of honesty that turns them into something slightly beyond human. For typical members of the crackpot community, I expect this never happens at all, or perhaps extremely rarely. Yet this need not be so if intentionally pursued.

What, therefore, should all the young and upcoming crackpots, those wannabe-scholars be pursuing? First, we all become addicted to nonfiction reading and ever so slowly accumulate vast and deep knowledge, sifting through it over months/years and eventually focusing on one or more niche topics that we find most attractive. Avoid literature paywalls by spending hours in the local college library. Then, through pleasure-reading of journal articles and old dissertations (almost by Feynman's Osmosis), we pick up the essentials of Rule One above. Along the way, we SEE THINGS that normal humans simply would not believe. (Heh, ships on fire off the Shoulder of Orion?) Messy academic infighting and the seamy side of science.<sup>3</sup> And, perhaps several tens of serious, unplumbed dissertation topics. Maybe hundreds. (This includes topics in the no-go areas.)

Most importantly, this gives us a scholars' wide perception of what's already been done, what can be done, and what's currently regarded as impossible nonsense. If all of the above is performed independently, we may end up becoming quite different than typical postdocs. To me, these ABD non-degrees are well worth pursuing. In addition, we encounter all the phenomena that non-experts perceive as anomalous and weird but, in fact, are utterly conventional. We learn to recognize the rare, genuine anomalies when we encounter them.

#### **RULE NO. 4: THE CRACKPOT-DETECTORS**

To be a crackpot is to whine loud and long about suppression. We'll even mention it in our journal submissions. Yet the wider professional community isn't stupid. Why aren't scientists complaining as well?

Outsiders might benefit from an important insight that scholars pick up along the way. We discover that ... THE PURPOSE OF SCIENCE IS SUPPRESSION! (Heh, the purpose of the scientific literature, that is.) Therefore, the wise professional expects it. We don't complain or even feel much surprise when it hits us personally. (Perhaps only moaning to colleagues in private.)

Or stated with less fervor: out in the professional

world, the true “Scientific Method” involves an invisible triage process, or as H. Bauer observes, science is based upon a progressive filter stack, (Bauer, 2001). Science only progresses when large amounts of rank untested proto-science pours into the filter’s wide end, and tiny amounts of well-tested textbook-prose is dripping from the narrow spout. The role of Bauer’s “Knowledge-filter” is to excise all wrong theories and block all flawed experiments. I don’t recall Bauer mentioning that; also, the filter intentionally and specifically senses the presence of probable crackpots. The Knowledge-filter may not sense typical intellectual hoaxes, but it contains numerous crackpot detectors. These take the form of crackpot-sensitized journal editors, reviewers, and the population of readers (all issuing private complaints to the editorial board!) Among other things, if you ever mention suppression or even hint at conspiracies, that triggers one of these detectors. (Then again, see the Bockris incident below: “false detections” of crackpots, where the end result is suppression of justified dissent.)

Early in the filter, one “detector” involves Rule Three above: Show us your credentials. Are you a published scholar from an accredited institution or a degreed professional in academia? If not, do other professionals vouch for you, or are you well-known in the private sector? If the answer is still no, then we’re going to view your submission with extreme suspicion, and at least in the past, major journals would reject papers out of hand. Additionally, the academic standards for “heretical” journals, such as *JSE*, parapsychology journals, etc., may be significantly higher than for non-taboo fields. Crackpot authors need to consider this when submitting work.

Knowing the above, I suggest that every non-degreed crackpot start out small, spending years practicing their academic professionalism via constant online publications or authoring a stream of educational videos over the years, developing a widespread scholarly reputation. Intentionally take on scholars’ role, with its habits of fanatical scientific honesty: practicing “the way it’s commonly done.” (I recently found that my better website articles are being cited in professional literature.)

Another example is that in the 1970s, a small group of unemployed Berkeley physics students distributed their crackpot papers among their own tiny group, as well as to some carefully selected experts. They were searching for methods to violate Relativity via FTL faster-than-light signaling. Instead, they unintentionally triggered a major revolution, unexpectedly unearthing some long-ignored issues involving Bell’s Inequality/entanglement (Kaiser 2011). Therefore, we should pursue crackpot “Einstein-denial” for the win? Well, they may find themselves in the same place as the Wright Brothers: obvious crack-

pots suddenly defined retroactively as having been proper professionals all along.

## RULE NO. 5: LABEL EVERY SPECULATION

A common human failing is that stories change with retelling. Exaggerations slowly grow without limit. In the crackpot underground, I observe this problem everywhere. It seems to always start with wild speculations being widely repeated. Nobody labels them as speculations, and next, “oft-repeated lies become Truth.” They’re not exactly lies, yet the familiar speculations are silently accepted as verified, even as solidly replicated.

Now, repeat!

New speculation is piled onto the old, and in the end, we have an immense edifice, layer upon layer, which slowly grew to become a vast iceberg of “fossilized speculation.” It describes an entire delusional world. With time, each collection of speculations might even be ‘annealed’ and made internally self-consistent, eventually producing an air-tight alt-reality which has little relation to well-tested knowledge.

Science apparently recognizes and scrupulously avoids this human failing. The crackpot symptom is eliminated by ruthless, unswerving honesty.

Therefore, if something is unproven and not part of conventional science, then we must explicitly state this in our papers, over and over and over, so there can be no question in the readers’ minds. Constantly label speculation as speculation. (In other words, fool nobody, remain utterly honest, hide nothing, and always give warnings about common, widespread misconceptions.) We must never pretend that untested speculations can serve as solid theories. If some proposed “facts” lack supporting evidence or prove impossible to replicate, then we must make certain that everyone well knows it. After all, persuasion is not our goal. We’re not trying to convince our readers or even sway them; we’re not trying to fool people in order to “win” some argument. Instead, we attempt to slice down through all the mistakes, misconceptions, and misunderstandings, looking for the genuine reality at the very center.

*Reality is that which, when you stop believing in it, doesn’t go away.” -SF author PK Dick (Dick et al., 1996, p. 261)*

## RULE NO. 6: PURSUE RADICAL HUMILITY

To subvert our built-in personal crackpotism, also we must strive for a form of extreme humility. Flee from all public recognition. Intend always to remain invisible, except to our tiny academic community. Let “self-effacing”



become our catchphrase.

We crackpots seem to regard such things as anathema. To us (and especially to our sub-group of ‘crazy inventors,’) science is just another “get-rich-quick scheme.” Science is a route to making millions and becoming a big-name celebrity, just like Isaac Newton with his secret gold transmutation project. We aim to become the next Einstein, with book deals made while earning huge fees on lecture tours and our faces on magazine covers. Chasing after the mega-breakthroughs and civilization-altering discoveries. Yet typical scientists instead value the exact opposite, instead religiously pursuing humility while fleeing the spotlight. They regard self-promotion as a toxin. But why is this?

I’m convinced that without it, yet again, the science and crackpot communities would be a single entity. Humility is designed to combat a widespread crackpot pathology: one which can be the ruin of careers. It’s an emotional bias produced by ego inflation. Many names exist: arrogance, pride/hubris, self-acclaim, and inflated self-assessment. Irrational ego-defenses. (In the 1980s, I coined the term “The Inventors’ Disease,” but it never caught on.) It seems to involve a subtle and profound kind of dishonesty. Or at least leads in that direction, up to and including outright fraud.

*“Desire for approval and recognition is a healthy motive, but the desire to be acknowledged as better, stronger, or more intelligent than a fellow being or fellow scholar easily leads to an excessively egoistic psychological adjustment, which may become injurious for the individual and for the community.” – A. Einstein 1936 (Einstein et al., 1954, p. 62).*

One symptom is an aggressive pursuit of top social standing in a crackpot field. Another is a sort of mentally unhinged, clinging to one single personal discovery, then flying into extreme paranoia and limitless ego inflation. Another is to chase after celebrity, letting public acclaim become our top goal, where good science and improving the world only arrive a distant second. Excessive pursuit of humility appears to offer an effective cure for this crackpot behavior.

Other symptoms can be the chasing of major prizes, and constantly pursuing the public spotlight and television interviews. Revolutionary science and “Ego-science” are the usual domains of crackpots: we insist that “Normal” science is boring, therefore we crackpots ignore it. If research doesn’t lead to wealth and prizes and vast public acclaim ...then we’re simply not interested!

Again, the major part of today’s professional community goes in the opposite direction: to instead strive

passionately for humility. Crackpots wishing to pursue genuine research are well advised to do the same. Flee the spotlight. Avoid news reporters. Your name must never become widely known.

Yet, in the academic fringe, self-funding is difficult without book deals. Also, all those revolutionary topics do exist, with Nobels awaiting: ...it’s a filthy job, eh? Very revolting to the truly humble. But somebody’s gotta do it! To prevent a slide into crackpotism, perhaps we can welcome contemporary rejection, while aiming for post-humorous recognition only. And then, if we ever do win a Nobel, our first thought should be, “How can I duck out from this thing?”

## RULE NO. 7: CREDULOUS TO CRITICAL

Crackpots typically never dare question themselves or put their fellows under critical scrutiny. To outsiders, they come off as excessively credulous, even fanatically so. But it’s no accident. Instead, I find that it’s a carefully maintained social phenomenon. Spend some time as a True Believer, and you’ll discover this “dark feature” of many crackpot communities, one where any non-credulous followers are rapidly ejected, banned from forums, etc. To test it, just try the opposite: publicly find fault with one of the big-name celebrities. Their followers will attack! You’ll be labeled a Randi-worshipping CSICOP spy, a covert FBI informant. A paid-off shill from the Oil Companies. Obviously, only an enemy outsider would dare insinuate that Tom Bearden had ever made errors, that John Bedini hadn’t discovered an entirely new technology, or that Joe Newman had lied to the US Congress. You’re now exposed to an interloper, someone from the Enemy Camps, sneaking in and trying to injure the faith of the dedicated believers. Even long-time followers are retroactively designated as having been ‘Enemy’ all along! Victims must recant or face communal shunning.

And a bit later, the larger group of celeb-followers dares never ask even a single cutting question. “Hey Uri Geller and John Hutchison, which of your many videos were fakes made for the TV crews?” Such things are just not done, and we crackpots well know what happens if we dare try. Some of us may have personally participated in the “witch burnings.”

As before, to be a legitimate researcher is to habitually reverse this. A goal of science is brutal critical appraisal: to Question everything, especially the famous names, and most especially ourselves. Journal releases can resemble skeet-shooting, where once we’re in print, it’s open season, and now colleagues are out to expose our egregious, unsuspected errors. We traditionally treat such criticism like gold. We use it to tighten up our future

work for the next go-around. We welcome it as a kind of destructive testing to verify that our work contains no concealed fatal flaws.

However, in the crackpot community, the above is true only rarely or never. Nobody dares criticize. Therefore, scientists are positioned opposite from crackpots on the credulous/critical spectrum. To fake being a real scientist, simply begin criticizing everything held dear in the crackpot community. Do it both openly and honestly; try to repair problems rather than fix blame. Imagine what will happen! (Heh, keep it up long enough, and perhaps you'll drill down to some actual truth. Find a genuine crackpot breakthrough; some diamonds in the dirt.)

### **RULE NO. 8: AVOID COMMUNITY JARGON**

Crackpots constantly mark themselves by “in-house jargon.” It’s an enormous error to include any of these terms in submitted papers. A short list: any mentioning antigravity, ZPE, “Overunity,” “Free Energy,” and “FE machines.” (This has little relation to Gibbs’ energy.) In dim and ancient history (~1970s,) “Free Energy Machine” was initially coined to deflect skeptical ridicule away from the Perpetual Motion inventors and their followers. “PM” had recently become a trademark of simple ignorance and so attracted hostile laughter from critics. To fix the problem, crackpots obviously must ...change the name! Skeptics quickly caught on and wrongly accused the new “Free Energy” community of being dishonest perpetual motorists in disguise. Why wrong? The Perpetual Motion quacks had also pivoted into belief in energy conservation, instead reinventing themselves as energy-harvesting quacks, where the source of energy is rarely named. (Many hoped to harvest joules as “ZPE;” all that energy was suspected in the zero-point field as predicted by Quantum Mechanics.) In order to carefully avoid the “crackpot-detector,” we must avoid mentioning ZPE, “FE,” or any similar terms in our journal submissions. Including these can be like including all-caps text ...in bright purple ink.

### **RULE NO. 9: WRITING “HIGH ACADEMICIAN”**

Crackpots may lapse into overly-pretentious language. Often, we’re just trying to mimic the phrases common in professional literature. We hope to be mistaken for the scientific in-group, perhaps faking our way to future scientific acceptance. Or perhaps intimidating our followers through use of lengthy or obscure words? But we’re unaware of some major issues.

In the outside world, when people personally approve of something, we commonly describe it in glowing terms, while for anything we dislike, we heap it with disparagement. We know that an idea is slimy, having just

spat all over it. For politics, religion, and for companies and competitors, our side must be elevated with complementary praise, while the enemy tribe receives belittling labels and smear campaigns. In crackpot science, we alter reality via glowing language for our personal theories and derogatory language against criticism from others or against any of our own flaws.

Professionals avoid this emotion-based language since it thoroughly distorts reality. If not, then some things magically become more important and truer, while others are marginalized, maligned, and disappeared. Yet reality remains unchanged. Nature isn’t slightly swayed, much less fooled. The whole process is one of profoundly dishonest persuasion. Reality disappears behind an emotion-based smokescreen as if the real world was never there in the first place. Yet, in everyday situations, most humans rarely halt the use of persuasive language or bother to employ exclusively neutral terms.

In professional research, instead, we strive to perceive the actual truth. We see a great need for the tentative approach, always employing neutral descriptions, because if we wish to perceive genuine reality, we must passionately avoid all those emotion-laden terms intended to bias/sway/convince the reader. This extends to battling our egoism by taking ourselves out of the picture, by eliminating the word “I” via third-person references, or by replacing it with “we.”

The crackpot community rarely acknowledges any need for this style of truth-seeking/clarified perceptions. They uselessly mimic the language but haven’t grasped the intent. If they banned all glowing self-descriptions of their private theories, then perhaps flaws would become perceptible. If they avoided all negative labels, then the voices of critics would be difficult to ignore. With honest and informed use of journal-style language, the painful truth may finally come out.

*It is a good morning exercise for a research scientist to discard a pet hypothesis every day before breakfast. It keeps him young. -Konrad Lorenz (Lorenz, 1963, p. 8)*

### **RULE NO. 10: ELCOMING CRITICAL ATTACK**

Never ignore criticism. Most crackpots fool themselves by doing almost anything to avoid admitting errors in public and even refusing to admit their errors at all. When criticized, they take it as a personal attack, and all their defenses engage. At best, they’ll retreat and silently alter their claims and hope that nobody notices the changes. More frequently, they’ll start piling lies upon lies, assembling tall stacks of sensible-sounding excuses.

(Perhaps they assume that, since nobody can read their minds, therefore nobody can ever catch them at it? And, since reality is whatever we say it is, with proof lacking, no lying has occurred?)

They remain crackpots because they're insufficiently honest, and this remains true whether or not anyone else knows this. If they were honest, then they'd drop all their defenses, admit their mistakes, and be totally vulnerable to critical attacks and skeptics' accusations. To ditch our crackpotism, we habitually ask ourselves, "Is my attacker actually in the right?" Unfortunately, in the world of the non-scientist, it matters little whether our enemies are correct. Truth be damned because the whole point is "to win."

Bingo, we've discovered another common crackpot signature. Watch carefully to see whether a person is constantly trying to "win" arguments, where they seem never to care which side is actually correct. Once "winning" becomes our goal, truth is made secondary, and we're now free to bring in persuasion techniques, politics-ploys, and logical fallacies.<sup>4</sup> Each one is a form of dishonesty. In the crackpot world, if our opponent is correct, then maybe we can fool everyone and still prevail in an ongoing debate. Skilled crackpots realize that nobody can defeat a person who simply ignores all criticism. In order to become professionals, we abandon all attempts to "win" and let the critical assessments strike hard.

## RULE NO. 11: THE TENTATIVE APPROACH

Crackpots lack "fanatical tentativeness." Working scientists may silently preface each statement with "I may be wrong, but..." It's tedious to keep repeating, so we habitually take it as a given. Instead, many crackpots fill their work with unsupported authoritative statements. They constantly display complete and utter certainty and indulge in "black and white" thinking, where untested claims can never remain unknowns, never simply be "unverified," but can only be completely true or utterly false. Perhaps a crackpot dishonestly tries to sway their audience, fooling people by exhibiting a sort of "false certainty" while adopting the façade of an authority figure.

For example, I've encountered many who display not a trace of self-criticism, instead showing unbending conviction that their novel theories are 100% true ...therefore, to them, any evidence (or even some brief testing) has no importance. They write and speak as if unverified inventions and theories qualify as breakthrough discoveries as if these were widely replicated long ago. (Are they attempting to mimic the "television authority," speaking with a deep newscaster voice, faking the role of unquestioned expert?)

Therefore, in order to detect crackpot writings, we can be on the lookout for strings of confident pronouncements,<sup>5</sup> and similar signs that an author has adopted such a stance. (And then for ourselves, we take great care to avoid that sort of trickery.)

*Doubt everything or believe everything: these are two equally convenient strategies. With either we dispense with the necessity of reflection.* – Henri Poincaré (Poincaré, 1905, p. XVII)

In his essay "The Nature of Knowledge" (Duncan & Weston-Smith, 1977), the late astronomer RA Lyttelton provided us with an excellent metaphor for all of the above. Imagine that our (dis)belief in any proposition is represented by a bead that can slide along a horizontal wire. The two ends of the wire represent 100% belief and 100% disbelief. The ends have no barriers. Then, for example, if our disbelief ever jumps from 99.999% to 100%, the bead immediately falls off the wire, and restoring it is nearly impossible. We become "True Disbelievers." In that case, the goal of every professional should be, no matter what, to *keep one's bead safely on the wire*. Maintain analog/fuzzy states only. During controversies, never display certainty; always remain fence-sitters. Never let our disbeliefs or beliefs approach 100%.

Those in the "fallen-bead state" become part of the population of fanatical believers and fanatical disbelievers. They've flipped into crackpotism, and now no amount of contrary evidence can shift their opinions. In their own eyes, they've achieved 100% certainty, where thinking is no longer required.

## RULE NO. 11A: THE "MENTAL SANDBOX"

Here's another technique I've found for keeping one's bead on the wire (preserving the tentative approach in some decidedly crackpot fields.) Just take time to develop an internal mental zone, your personal "concept-testing sandbox." Then, rather than sneeringly rejecting every suspicious idea or blindly accepting them all, we maintain a dedicated test lab inside our own heads. There, the main rule is "Provisional Acceptance." It's a place where we can take on alternative viewpoints while also storing all the Untrusted Ideas. (Or maybe affix a big sticky label to incoming new concepts: "possible toxin, not for internal use.")

After all, we'll never honestly consider the ideas we've already rejected before testing. With a separate 'sandbox,' we won't need to maintain a biased mindset; a tightly closed-minded scoffer/skeptic viewpoint is only held in order to protect ourselves from all the loony ideas

floating around out there. Instead, we can welcome them all... into our airtight testing chamber, where our “pretend self” can become totally meme-infected, all the while being observed by our real self in the observation booth behind the one-way glass. Now we can honestly test all those crazy claims Rejected by Conventional Science while also having lots of fun at Flat Earth meetings and crackpot-physics conferences ...daring to explore highly taboo areas, playing with mud pies while wearing gloves. This is important because amazing diamonds may be hidden within the famous “Black Tide of Mud.”

## RULE NO. 12: CRITICIZE COLLEAGUES

Do crackpots believe that *only their own work* is valid and legit, while all the presenters at the last big conference are crowds of florid pseudoscientists? Heh, no, instead, that describes academic edge science. (So we’re probably safe? But this makes for awkward conversations at the bar in the conference hotel.) Instead, out here in the actual crackpot community, we believe that every single unconventional claim *must be 100% true!* You heard me. Every. Single. One. That constitutes another major crackpot symptom that needs to be avoided. In submitted papers, never hint at such things. (For example, in order to trigger the crackpot-detector, simply write as if the various odd devices all work like gangbusters...even though different approaches number 50-100. Never voice suspicions that any could be financial frauds, crude hoaxes, or an entire population of experimenters who all fool themselves. Instead, state (or just insinuate) that these have been suppressed by vast conspiracies.)

Therefore, in academia, I believe that none of us need to apologize for having low regard for certain of our fellow mavericks. “That just means it’s working.” It’s just our astute intellectual defenses automatically preventing us from sliding down the same slope which has apparently trapped the entire crackpot community.

## RULE NO. 13: SLIDING TO CRACKPOTISM

If you lack a degree, might you be open to crackpotism? The opposite is certainly false: having a PhD is no protection. I’ve watched several degreed researchers slowly become full-blown crackpots. Even some famous names were victims. (I was personally involved in two such events.) The routes seemed basically the same, so we can attempt to recognize and avoid them.

First, a completely non-maverick researcher unwittingly makes a very unconventional discovery or perhaps hits a major no-go region in their field: a science taboo. Their paper is returned without review. Repeatedly. Even obscure journals will refuse to take a chance. After mul-

multiple attempts, typically, they encounter very strange events: editors going silent, immense unexplained reviewer delays, etc. They discover that they’ve slammed into an unsuspected barrier, one they’ve never encountered before. Their clear and simple evidence was ignored without inspection, and their little discovery was completely “Suppressed by Authorities.” It appears that journals don’t only suppress genuine errors; they fall into the all-too-human weakness where solid evidence for major anomalies is uniformly rejected ...*Intellectual Suppression of Dissent* (Martin, 1998).

Next, after everything has calmed down, they find themselves thinking, “...if it happened to *\*ME\**, maybe the same thing happened to others in the past. Maybe it’s even happened to *many* others. Maybe science is not what we think it is, maybe an unknown number of discoveries were similarly blocked, ...and I’ve just had my nose rubbed in the fact? Maybe all the quack-medical claims and crackpot-physics discoveries ...ALL are actually true? Easily, it could be so. They were dishonestly suppressed by this same hostile, knee-jerk response, this universal disbelief!”

Yep, racing right down the slippery slope.

I encountered several examples, so perhaps this is common. One major incident involved a top electrochemist during the early “Cold Fusion” era: the late J. O’m Bockris (Mallove, 2000). After personally producing Tritium in a “low-energy nuclear reaction,” he suddenly welcomed a member of the crackpot underground into his lab: a “Gold Transmutation” claimant, bringing him in to collaborate. (No significant gold resulted, and also, the guy turned out to be an extremely shady character.) Colleagues at Texas A&M then tried to have Bockris ejected from the department. Twice! This, even though he was about to retire. (Never lose awareness that exploring the No-Go Regions endangers careers and also that some heretic outsiders really are money-driven frauds.)

## THE CRACKPOT INDEX

A final comment ...if you aren’t already familiar, go check out John Baez’s venerable “Crackpot Index” hosted at UC Riverside<sup>6</sup>.

## ENDNOTES

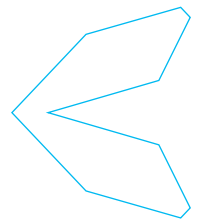
- 1 For those who dislike the phrase “science taboos,” we might name them no-go areas. Each field has its own set of these. (I’m sure that many of us can list some examples.)
- 2 By “crackpot,” I don’t mean mild schizophrenia or psychosis, i.e., not the physics papers literally written in purple crayon. Instead, I’m referring to the commu-

nities pursuing “antigravity in your garage lab” and “Electric Universe,” as well as the devoted followers of various tribal Big Men: all those not-to-be-questioned celebrities such as the late Tom Bearden and John Bedini today, or in earlier times, Aristotle. Also, note well that I’m quite unfamiliar with similar issues in alt-medical.

- 3 Very small book list below: some collected stories regarding a bit of fascinating “dirt” about science:
  - R. Silvers ed., “Hidden Histories of Science”
  - WIB Beveridge, “The Art of Scientific Investigation”
  - J. Martin (Anon) “To Rise Above Principle.”
  - J. Schmidt, “Disciplined Minds”
- 4 Note a proposed new logical fallacy from Philosopher Peter Suber: The Fallacy of One-Sidedness, also see his “The Clinical Attitude Toward Argument.” <http://legacy.earlham.edu/~peters/courses/infllogic/inflhome.htm>
- 5 Some crackpots add numerous references, seemingly pasted on like stucco after construction was long completed. These may be valid but they also may be papers that we suspect the author never read. Or, they may only reference crackpot literature: the popular articles describing extremely unverified claims. Better that we use no references at all than instead trying to fake it.
- 6 Baez lists over thirty “tells” of the full-blown florid crackpot, particularly regarding physics-lunacy. However, that’s not our topic at present. For the most part, the members of the wider crackpot community aren’t mentally damaged. (If you suspect some personal problems, take Baez’s test, which is linked below. But also remember, a suspected signature of the true crackpot is to remain always in complete denial!) <https://math.ucr.edu/home/baez/crackpot.html>

## REFERENCES

- American Association for the Advancement of Science. (1994). *Science for all Americans: Project 2061*. 1-14. Author.
- Bauer, H. H. (2001). *Fatal attractions: The troubles with science*. Cosimo, Inc.
- Dick, P. K., (1996). *The shifting realities of Philip K. Dick: Selected literary and philosophical writings*. L. Sutin (Ed.) Vintage Books.
- Duncan, R., & Weston-Smith, M. (Eds.) (1977). The nature of knowledge. *The encyclopedia of ignorance* (pp. 9-18). Pergamon Press.
- Einstein, A., Seelig, C., Bargmann, S., Unna, I., & Wolff, B. (1954). On Education. *Ideas and opinions*. Wings Books.
- Feynman, R. (1974). *Cargo cult science: Some remarks on science, pseudoscience, and learning how to not fool yourself*. Commencement address, Caltech.
- Kaiser, D. (2011). *How the hippies saved physics: Science, counterculture, and the quantum revival*. WW Norton & Company.
- Lorenz, K. (1966). *On aggression*. Methuen and Co. Ltd.
- Mallove, E. F. (2000). The triumph of alchemy: Professor John Bockris and the transmutation crisis at Texas A&M. *Infinite Energy*, 6(32), 9-24.
- Martin, B. (1998). Strategies for dissenting scientists. *Journal of Scientific Exploration*, 12, 605-616.
- McComas, W. F. (1996). Ten myths of science: Reexamining what we think we know about the nature of science. *School Science and Mathematics*, 96(1), 10-16 <https://doi.org/10.1111/j.1949-8594.1996.tb10205.x>
- Poincaré, H. (1905). *Science and hypothesis*. Science Press .



**RESEARCH  
ARTICLE**

# Who Sees UFOs? The Relationship Between Unidentified Anomalous Phenomena Sightings and Personality Factors

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## HIGHLIGHTS

A new study finds that witnesses of unidentified anomalous phenomena in the general public are neither neurotic nor especially vulnerable to perceptual or cognitive errors, and their reports often parallel those of military witnesses.

## ABSTRACT

Unidentified Anomalous Phenomena (UAP) have become a serious topic in the US Congress, and new legislation has been released outlining a plan for declassification for the public. There are numerous factors that could lead an individual to mistakenly think they saw a UAP, including the proclivities of the personalities that observe what they think to be a UAP. This study examined the big five personality traits: extraversion, neuroticism, openness, agreeableness, and conscientiousness, as well as schizotypy traits, to see if UAP experiencers could be distinguished from people who had not seen a UAP. The study included 206 participants, with 103 people who self-reported to have seen a UAP. Latent profile analysis was conducted on the personality variables to explore the grouping of participants. Group one was average on the traits, a second cluster was labeled as the Neurotic/Schizotypy group, which was high in neuroticism and schizotypy traits, and a third group was labeled as O-ACE, which were high on openness, agreeableness, conscientiousness, and extraversion but low on neuroticism and schizotypy traits. The findings indicated that the O-ACE group was more likely to see UAP, but this effect was not strong. A presumptuous stereotype exists in the general public that people who see UAP are probably people who are emotionally reactive (neurotic) and vulnerable to perceptual and cognitive abnormalities, but this was not evident in our data. We also found that the descriptive UAP accounts by the general public were similar to the descriptions provided by military witnesses. It was also of note that only 28% of participants reported their sightings anywhere, and 14% used a UFO reporting organization, which suggests that events are vastly underreported. Stigma and a lack of places to legitimately report sightings appeared to be primary barriers. The conclusion of this study is that personality factors are an insufficient explanation for most UAP sightings.

## KEYWORDS

Unidentified anomalous phenomena, personality, schizotypy, stigma, unidentified flying objects.



## INTRODUCTION

The Unidentified Anomalous Phenomena (UAP) Disclosure Act of 2023 defined UAP as “any object operating or judged capable of operating in outer space, the atmosphere, ocean surfaces, or undersea lacking prosaic attribution” (p.10). This legislation has been created because it has come to the attention of the United States Congress that there could be governmental and private organizations holding UAP material not within the oversight of Congress and the records that have not been declassified partially due to the misuse of restrictions under the Atomic Energy Act of 1954 (UAP Disclosure Act of 2023). The proposed legislation has emerged in the context of numerous events since 2017 (Cooper et al., 2017a,b). There have been three public congressional hearings regarding UAP (Committee on Oversight and Accountability, 2023; House Intelligence, 2022; U.S. Senate Committee Armed Services, 2023), two public reports (Office of The Director of National Intelligence, 2021; Office of The Director of National Intelligence, 2022) and one briefing by the National Aeronautics and Space Agency (NASA Video, 2023).

In June 2023, David Charles Grush from the National Reconnaissance Office, the National Geospatial-Intelligence Agency, and the UAP Task Force told the public that there have been multiple recovered UAPs, with the earliest being in 1933 (Kean & Blumenthal, 2023). His accusations, based on four years of investigation, have since been deemed by the Inspectors General as credible and in need of urgent attention (Kean & Blumenthal, 2023). The evidence that has led to these assertions has not yet been made public at the time of this publication. But whatever it is, it must be sufficiently compelling to have triggered the US Congress members, the Inspector General (Compass Prose Legal Group, 2023), and numerous pilots (Committee on Oversight and Accountability, 2023) to take such a firm and public stance on a topic that has been mired by substantial stigma, ridicule, and disbelief.

Prior psychological research (Swami et al., 2011) shows that belief in extraterrestrial life can be predicted by individual differences in personality and a tendency toward unusual perceptual experiences. Could it be that the allegations of UAP sightings are by a small minority of people who are extremely high on openness personality traits and have a tendency towards atypical perceptions that lead them to think they have seen something when, in fact, it might be prosaically explainable? Such a conclusion seems unlikely given the high caliber of witnesses currently coming forward, but it is the current status-quo hypothesis from an individual-differences research perspective. This study aims to re-examine this hypothesis

by comparing the personality characteristics of people who have and have not had a self-reported sighting of a UAP, as the predictors of belief might not equally predict sightings. This study also aims to gather data on the extent to which UAP sightings go under-reported.

## Background & Context

The term UAP, in both an academic and public context, has been a relatively recent addition. Most typically, UAPs have historically been referred to as Unidentified Flying Objects (UFOs), but this term is now regarded as inadequate for describing the entirety of what is observed. Many UFOs are not reported to be ‘objects’ but something more indescribable to the witnesses and can co-occur with paranormal or parapsychological effects. Hence, the term *Unidentified Ariel Phenomenon* has been used. However, many UFOs have been observed underwater and are referred to as Unidentified Submerged Objects (USO); hence, some documents have used the term Unidentified Ariel and Undersea Phenomenon (UAUP) to encompass both areas. But that term excludes upper and outer atmosphere observations. Therefore, the current parlance takes into account all of the potential domains of observation, hence the term Unidentified Anomalous Phenomena as defined above. The term UAP will be used below irrespective of what was used in the original source referenced to aid readability and to be consistent with the proposed legislation (UAP Disclosure Act of 2023) unless it is the name of a group with UFO in the title or a participant’s direct comment.

In 2021, YouGov (Nolsoe, 2021) conducted a survey about alien belief in the UK and found that 49% of people thought it was likely that the UK government knows more about UAP than they are revealing. The findings also indicated that 7% of people believe that they have seen a UAP, which equates to approximately 4.7 million people in the UK. Although this may seem like a large number of people, there are numerous terrestrial prosaic reasons why someone might be wrong about what they think they saw. The following is not an exhaustive list, but many of the following factors can lead to a misidentification of objects. Humans can make errors by perceiving an object to be moving fast when it is not (Kang et al., 2008); we can perceive time as slowing down due to shock, danger, and/or anxiety (Ahmadi et al., 2019). Psychotic processes, including hallucinations (Moskowitz et al., 2019), delusions (Connors, 2015), and paranoid tangential thinking, do not exclusively occur in those who have a mental health diagnosis. Sleep paralysis (Sharpless & Doghramji, 2015) is a well-documented potential factor that can explain some accounts of alien abductions (Clancy, 2005; McNally &

Clancy, 2005; McNally et al., 2004). Hypnosis has been known to create false memories (Robertson, 2013; Robin et al., 2018). Human memory is prone to various cognitive errors that can lead to false beliefs or memories (Loftus, 2003; McGaugh, 2003). Some people score very highly on measures of gullibility and suggestibility (Preece & Baxter, 2000), which would increase the chances that they believe an atypical interpretation of an experience. Confirmation bias (Kappes et al., 2020) is the process by which an individual unintentionally recalls information that is congruent with their prior knowledge. Thus, people end up seeing what they think is there, not what is objectively there. Another potential terrestrial explanation for UAP sightings is that there is something about the personality characteristics of experiencers that make them more prone to believing that they have seen a UAP.

Swami and colleagues (2011) explored what personality traits were most evident in people who believed in extraterrestrials (UAP had not become common vernacular at the time of their work). Their study included 422 participants and the following measures: Extraterrestrial Belief Scale (Swami et al., 2009), Australian Sheep-Goat Scale (Lange & Thalbourne, 2002) to measure paranormal beliefs, the superstitious beliefs scale (Wiseman & Watt, 2004), Oxford-Liverpool Inventory of Feeling and Experiences (O-LIFE) (Mason et al., 1995) to measure schizotypy traits and the NEO-Five Factor Inventory (Costa & McCrae, 1992) to measure individual differences in personality. They found significant but small effect sizes indicating that people who believe in alien visitation and a cover-up were more likely to be high in paranormal beliefs, schizotypy, and openness traits but lower in educational attainment, extraversion, and agreeableness. Hierarchical regression indicated that paranormal and superstitious beliefs accounted for 32% of the variance in belief in alien visitation, followed by schizotypy (5%) and the Big-5 personality factors (1%). Based on these findings, they concluded that belief in extraterrestrials is statistically expected in those who are high on openness, believe in the paranormal, have had less education, and are prone to unusual perceptual experiences. However, such conclusions should be regarded as tentative given the small effect sizes and the fact that no effort was made to see if their sample included anyone who actually believed they had had a sighting of UAP. Therefore, no conclusion can be made regarding whether or not UAP sightings could be partly explained by the intrinsic personality characteristics of the witness.

This study aims to analyze whether or not it is a particular kind of personality profile that increases the chances of claiming to have seen a UAP. This will be achieved by examining the statistical correlations be-

tween UAP sightings and the personality characteristics of the witnesses, as well as the patterns observed in a latent profile analysis. Latent profile analysis is a modeling technique for extracting unobserved latent groupings in data. These class memberships can then be used in other statistical analyses as independent or dependent variables. The emphasis in latent profile analysis is to determine the number of clusters underlying the data (through statistical and model fit criteria) and the interpretability of the cluster solution. Latent profile analyses have been used many times (Espinoza et al., 2020) to study 'Big Five' personality data to extract "kinds"/ "groups," and typically, three clusters are extracted. By using these clusters in this study, the purpose will be to explore whether or not particular kinds of people clustered on individual differences that can be used to predict whether or not someone has had a self-asserted sighting of a UAP. This study will also represent an opportunity to gather information on what types of UAP objects the general public has seen and to compare them to the publicly available data on military witness sightings provided by the All-domain Anomaly Resolution Office (AARO) (U.S. Senate Committee Armed Services, 2023). It will also provide data on the frequency of reporting and the reasons they do not report their UAP sightings.

## METHOD

### Participants

The original data set consisted of 246 cases, but 41 were removed due to extensive missing data. These were likely to be cases in which people clicked on the link but did not fill out any of the measures. These cases were removed, and the remaining sample consisted of 206 participants with an even split between the proportion that had and had not had sightings. No efforts were made to attempt an even split in the data. The frequency of ages was as follows: 26 were 18-24, 29 were 25-34, 53 were 35-44, 54 were 45-54, 32 were 55-64, and 12 were older than 65. The majority were male (129), and the majority had a degree (17 GCSE, 56 A-Level, 65 Bachelor Degree, 36 Masters Degree, 11 Doctoral Degree, 13 Diploma, and eight other degrees<sup>1</sup>). Exactly half the sample had a self-reported sighting of a UAP ( $n=103$ ). The participants were gained via "UFOTwitter" as this was felt to be the largest online group involved/interested in the topic that could anonymously contribute to the research. Local UAP interest groups were not of sufficient size and may over-represent the frequency of sightings in their sample, and a sample of the general population may not yield a sufficient sample of people with sightings. UFOTwitter provided access to potential participants with and without sightings in a



manner commensurate to the limited resources at the researcher's disposal.

## Materials

**Extra-terrestrial Belief: Extra-terrestrial Belief Scale (Swami et al., 2009).** The extra-terrestrial belief scale (EBS) consists of 37 items that measure three dimensions of extra-terrestrial beliefs: alien visitation/cover-up, scientific search, and general belief. Respondents were asked to rate each statement on a seven-point Likert scale ranging from "strongly disagree" to "strongly agree". Item examples of the alien visitation and cover-up items include; *"The government of this country is covering up the existence of extra-terrestrial life"* and *"Unidentified flying objects (UFOs) observed in the skies are in fact sightings of the spacecraft of intelligent extra-terrestrials"*. Item examples of the scientific research subscale include; *"The search for extra-terrestrial life is a serious and important scientific endeavor"* and *"Governments should direct more funding to the scientific search for extra-terrestrial life"*. Item examples of the alien visitation subscale include; *"Given the size and age of the universe, it is very likely that extra-terrestrial life must exist"* and *"If earth-like planets exist in the universe, then it is likely that earth-like organisms will have evolved on those planets."* The measure produces a total score between 37 to 259, with a score of 37 representing respondents with little or no belief in extra-terrestrial life. A score of 259 indicates a high level of belief in extra-terrestrial life. The EBS has an acceptable level of reliability ( $\alpha = 0.75 - 0.90$ ); this is consistent with previous research and provides evidence that the EBS is correlated with extra-terrestrial beliefs (Swami et al., 2009). This measure was chosen because it was the same dependent variable used by Swami et al. (2011).

**Personality: Big Five Inventory (John, Donahue, & Kentle, 1991).** The Big Five Inventory (BFI) comprises 44 items measuring the five dimensions of personality: extraversion, agreeableness, conscientiousness, neuroticism, and openness. Respondents must rate each statement on a seven-point Likert scale, ranging from "strongly disagree" to "strongly agree" regarding how much each item is or is not congruent with how they see themselves. Each personality dimension is represented by eight to ten statements. Item examples of extraversion include; *"is full of energy"* and *"generates a lot of enthusiasm."* Item examples of agreeableness include; *"is helpful and unselfish with others"* and *"has a forgiving nature."* Item examples of conscientiousness include; *"does a thorough job"* and *"perseveres until the task is finished."* Item examples of the neuroticism subscale include; *"is depressed, blue"* and *"worries a lot."* Item examples of the openness sub-

scale include; *"is original, comes up with new ideas"* and *"is ingenious, a deep thinker."* The BFI has acceptable reliability (Internal consistency of  $\alpha = 0.75 - 0.80$ , test-retest reliability of  $r = 0.80-0.90$ ). The BFI scores are correlated with other psychometrically sound measures of the Big Five factors, showing high construct validity (Worrell & Cross, 2011). This measure was chosen over the NEO-5 because it is free and shorter but still has acceptable psychometric properties.

**Schizotypal Personality Questionnaire-Brief Revised (Davidson et al., 2016).** The Schizotypal Personality Questionnaire-Brief Revised and Updated (SPQ-BRU) consists of 32 items to measure schizotypal personality. It measures the four schizotypal symptoms: interpersonal, cognitive-perceptual, disorganized, and social anxiety. This shortened questionnaire was derived from the original Schizotypal Personality Questionnaire (which contains 74 items) in order to improve specificity. Respondents are asked to rate each statement on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree," resulting in a total score between 32 and 160. Item examples of the cognitive-perceptual subscale include; *"Do you sometimes feel that people are talking about you?"* and *"I often feel that others have it in for me."* Item examples of the interpersonal subscale include: *"I find it hard to be emotionally close to other people"* and *"I tend to keep my feelings to myself."* Item examples of the disorganized subscale include; *"I am an odd, unusual person"* and *"I have some eccentric (odd) habits."* Item examples of the social anxiety subscale include; *I get anxious when meeting people for the first time"* and *"I feel very uncomfortable in social situations involving unfamiliar people."* A score of 32 indicates few or no schizotypal traits, while a score of 160 indicates that the respondent possesses numerous schizotypal traits. The SPQ-BRU has an acceptable degree of reliability (Internal consistency of  $\alpha = 0.93$ ) and is, therefore, significantly correlated with the original SPQ. Furthermore, the SPQ-BRU scores are correlated with other psychometrically sound measures of schizotypy, demonstrating evidence of construct validity (Asan & Pincus, 2023). This measure was chosen to explore if more pathological levels of schizotypal presentation were evident in the population group.

## Additional Variables

The following questions were created for this study to measure UAP sightings and the frequency of reporting. *"Have you ever witnessed/experienced a UAP before? If you are unsure whether what you have experienced was a UAP, please select 'Yes' and leave a description of your experience below."* If they clicked Yes, they were asked to provide a

**Table 1.** Descriptive Statistics and Missing Data Across Subscales

Measure	Subscale	N	Mean	Median	SD	Variance	Min	Max	One Missing Data Points	Two Missing Data Points
Extraterrestrial Beliefs Scale	Belief in Alien Visits	206	4.33	4.45	1.06	1.14	1.09	6.45	2	1
	Belief in Scientific Search	206	4.12	4.16	.62	.39	1.00	5.5	6	0
	General Alien Belief	206	3.88	4.00	.52	.27	1.5	5.83	2	0
Big-5	Extraversion	196	31.55	32.00	9.53	91.00	9.00	56.00	4	0
	Agreeableness	196	46.28	46.00	6.87	47.27	24.00	63.00	7	0
	Conscientiousness	195	43.98	43.87	8.94	80.09	22.00	62.00	2	0
	Neuroticism	195	30.02	29.00	9.92	98.50	8.00	57.00	2	0
	Openness	196	53.39	53.00	7.80	60.87	23.00	70.00	5	0
Schizotypy	Total	194	82.88	83.00	20.87	435.83	11.60	139		
	Social	194	12.26	13.00	4.67	21.85	4.00	20.00	1	0
	Cognitive-perception	194	33.09	33.00	9.40	88.47	14.00	59.00	1	0
	Interpersonal	194	14.48	14.00	5.45	29.73	6.00	29.00	0	0
	Disorganised	194	23.34	24.00	7.61	57.93	8.00	40.00	1	0

brief description of what they observed. This open-ended question meant that no restraints were placed on what they described. Participants were provided with a definition of UAP in the information sheet; therefore, they were aware of what a UAP was before admitting to whether or not they had seen one. They were also asked if they reported their experience anywhere. If yes, then where did they report it? If No, why didn't they report the experience? The options they were given for reporting were Police, National UFO Reporting Centre, Mutual UFO Network, Swansea UFO Network, Birmingham UFO network, and Other [open text box].

**Procedure**

Ethical approval was granted by the Cardiff Metro-

politan University Psychology Ethic Panel (Approval number UG-7287). The measure items were created on Qualtrics (2023) and released via Twitter (now X) on the lead authors' account (Stubbings, 2023) on the 16<sup>th</sup> of March, 2023, at 6:03 AM. The tweet read, "Participants needed for a research project into UFO/UAO. Everyone with or without a sighting needed," and it was retweeted by 63 accounts and viewed a total of 30,300 times. There was no time limit, and participants could stop at any time. They were not able to withdraw their data due to the method of data collection. Participation was voluntary and not compensated. Once the data was collected, it was analyzed with the aid of SPSS software, JASP (JASP Team, 2023), and Mplus 8 (Muthén & Muthén, 1998-2017). Data collection began on 16.03.2022 and was closed on 28.03.2023 because the

**Table 2.** Correlation matrix of study variables.

	UAP sighting	UAP reporting	Belief in Alien visitation	Belief in Scientific Search	General Alien Beliefs	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness	Schizotypy	Gender	Age	Education
UAP sighting	1													
UAP reporting	. <sup>a</sup>	1												
Belief in Alien visitation	.29***	.13	1											
Belief in Scientific Search	.16*	.15	.36***	1										
General Alien Belief	-.06	-.06	.07	.28***	1									
Extraversion	.03	-.06	-.06	.08	.04	1								
Agreeableness	.15*	.11	.25***	.02	.03	.20**	1							
Conscientiousness	.20**	.15	.10	.12	.01	.14*	.32***	1						
Neuroticism	-.22**	.01	.05	.06	.05	-.29***	-.32***	-.39***	1					
Openness	.23***	.19	.02	.13	.02	.26***	.22**	.15*	-.17*	1				
Schizotypy	-.07	.09	.16*	.07	.10	-.44***	-.35***	-.38***	.54***	-.07	1			
Gender	-.11	.07	-.01	-.11	-.01	-.06	.06	-.05	.06	-.14	.04	1		
Age	.30***	.09	.14	.10	-.06	.09	.20**	.31***	-.25***	.33***	-.28***	.14*	1	
Education	-.12	-.14	-.34***	-.04	.08	.07	-.16*	.05	-.15*	.13	-.10	.01	-.02	1
N	196	98	206	206	206	196	196	195	195	196	194	200	206	185

Note. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ . <sup>a</sup>A correlation cannot be computed because one of the variables is a constant. Age and education are ordinal variables. Age values are 1=18-24, 2=25-34, 3=35-44, 4=45-54, 5=55-64, 6=65+. Education values are 1=GCSE, 2=A-level, 3=bachelors degree, 4=masters degree, 5=doctoral degree.



**Table 3.** Places Sightings Were Reported.

Place of Reporting	Number
Mutual UFO Network	11
Twitter/X	4
National UFO Reporting Centre	2
Yorkshire UFO Society	1
Unspecified social media claiming to be investigative reporters	1
Local Church	1
Online to other experiencers	1
To a psychology professor in the US	1
Reddit	1
Local News paper	1
BBC Newsroom	1
Other-No comment	1
Somewhere, cannot recall	1

student had obtained enough participants for the desired power, and the response frequency had dramatically reduced to the point that additional data became unlikely.

**RESULTS**

**Descriptive Statistics, Missing Data & Correlation Matrix**

For the final sample of 206, there was some missing data; the details are provided in Table 1. For cases in which an item was missed, the total score was obtained by dividing the total score for the missing case subscale and multiplying it by the total score for the subscale. For example, if the subscale had nine items but only eight were present, then the total was divided by eight and multiplied by nine so that total scores were equivalent across the limited array of missing data points. The correlation matrix between variables is provided in Table 2.

**Sightings**

Of the 206 participants, 103 had sightings, with a total of 132 sightings across the group (some had multiple sightings in their descriptions), but only 27 (26%) reported it anywhere, and only 14%<sup>2</sup> Reported it to a UAP reporting group- see Table 3. The reasons for not reporting were provided by participants in an open text box, reviewed, and placed into categories. For the 103 with sightings, 82 provided reasons for not reporting. The primary reason

**Table 4.** Comparison to ARRO Data and Qualitative Examples

Shape of Object	Comparative Military Witnesses Group (ARRO)	Current Study	Qualitative Example of Some Participants
Orb/Round/Sphere	52%	26%	"An orb, like a mirror ball the size of a basketball dropped down (as if falling from straight overhead) in front of my car one night and before it hit the road in front of me, right when it was illuminated by my headlights, it froze 6-8 feet from the ground, hesitated for a moment and then shot straight back up into the sky so fast it left a streak"
Oval	3%	-	
Star-Like/Undefined Lights		30%	"Was out star watching on a clear night in May, on our farm...A short while later, a bright object came from the south. Very similar to a satellite, which I observe regularly. As it passed over me, it stopped, flared up brighter than anything else in the sky and then headed back in the direction it came from."
Lights	5%		
Uncharacterized		17%	"My wife and I were outside in our backyard one night for a few hours having a fire in the summer of 2020... She pointed up and asked "what is that?". I looked up and saw something I can't explain to will. It was hovering, was lit up in a reddish color, and didn't look like anything else I've ever seen. It was there for a few minutes and then left. We both were fascinated by it and couldn't look away. I've tried to rationalize it by thinking it was a drone but parts of it moved in ways that nothing else I've seen could do"
Ambiguous Sensor <sup>1</sup>	23%	-	N/A
Tic-Tac/Cylinder	3%	3%	"I saw a white cylinder in the sky during the day with clear skies, and I watched it just disappear and was unable to find it anywhere in the sky." "I saw a large, completely silent, completely black, cigar shaped object glide through the sky. It was darker than even the night sky around me and made absolutely no noise. I watched it for a few seconds until it disappeared past trees and out of view."
Disk	2%	5%	"The most spectacular was a saucer shaped craft the size of a football field. I watched it come down the valley moving directly over me, it wouldn't have been more than 200 meters above me. It carried on up the next valley moving quite slowly. It had revolving different colored lights on the edge. It made no sound. This happened at 4 o'clock in the morning and was witnessed by several farmers in the area." "One evening.... I was looking at the [the night sky] and I thought I was seeing a helicopter on approach but the luminosity diminished until a dark, disc-like silhouette appeared. This appeared to slow, then accelerate eastward, abruptly change direction (at approx. 45 degrees), accelerate again, then change direction at 90 degrees, before accelerating rapidly, seemingly outside the atmosphere."
Triangle	1%	10%	"A huge, jet black, perfect triangle moving silently, partially submerged moving just off the coast of a very remote part of .... It followed the coastline, in very rough seas but wasn't being affected by the wind or rough condition. It just moved smoothly and silently."
Square	1%		"A giant black triangle hovering silently above a field opposite our house about a 100 meters away. It was approx. 30 meters from the ground and had a bright white/orange light at each corner."
Rectangle	1%	3%	"Truck-size black rectangle flying low and slow over the suburbs."
Polygon	1%	0%	"I witnessed a flying gold/bronze cube shape while driving on a busy street" N/A
Other	-	6%	"White metallic egg shaped UFO approximately 6 meters in length, 200 meters away ascending silently from behind a hill. Developed a blue aura, faded and disappeared." "Driving home...observed a stationary metallic pyramid-shaped craft at approx. 20,000ft, clear blue sky, observed for 15 minutes."

<sup>1</sup> ARRO gave no definition of how "Ambiguous Sensor" was defined but it was used as a category, hence its inclusion here.



**Table 5.** UAP sightings and reporting by education, age, and gender.

	UAP sighting		UAP reporting	
	No	Yes	No	Yes
<b>Total</b>	<b>103 (50%)</b>	<b>103 (50%)</b>	<b>76 (73.8%)</b>	<b>27 (26.2%)</b>
<b>Education</b>				
GCSE	5 (29.4%)	12 (70.6%)	8 (66.7%)	4 (33.3%)
A-level	29 (51.8)	27 (48.2%)	19 (70.4%)	8 (29.6%)
Bachelors degree	32 (49.2%)	33 (50.8%)	25 (75.8%)	8 (24.2%)
Masters degree	22 (61.1%)	14 (38.9%)	10 (71.4%)	4 (28.6%)
Doctoral degree	6 (54.5%)	5 (45.5%)	5 (100%)	0 (0%)
Other	4 (50%)	4 (50%)	2 (50%)	2 (50%)
Collage/diploma	5 (38.5%)	8 (61.5%)	7 (87.5%)	1 (12.5%)
<b>Age</b>				
18-24	23 (88.5%)	3 (11.5%)	3 (100%)	0 (0%)
25-34	14 (48.3%)	15 (51.7%)	9 (60%)	6 (40%)
35-44	28 (52.8%)	25 (47.2%)	21 (84%)	4 (16%)
45-54	22 (40.7%)	32 (59.3%)	24 (75%)	8 (25%)
55-64	12 (37.5%)	20 (62.5%)	15 (75%)	5 (25%)
65+	4 (33.3%)	8 (66.7%)	4 (50%)	4 (50%)
<b>Gender</b>				
Male	56 (46.3%)	65 (53.7%)	52 (74.3%)	18 (25.7%)
Female	40 (58%)	29 (42%)	20 (69.0%)	9 (31.0%)

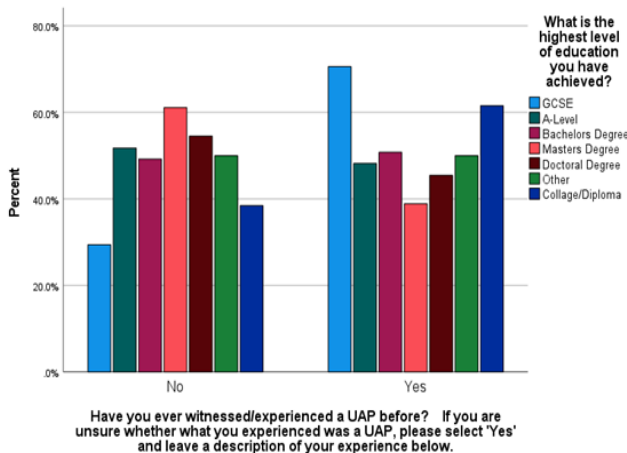
for not reporting the sightings was that they did not know where to report it 25% (21), followed by stigma 18% (15), or didn't see the point 15% (13). Other reasons for not reporting included being too young 7% (6), didn't realize it was anomalous at the time 7% (6), experience was too fleeting 7% (6), didn't have any evidence after it 6% (5), didn't occur to them 5% (4), was dismissed when they did tell people 4% (3), thought it was a personal experience just for them 3% (2) and 4% (3) gave other reasons that didn't fit a category.

Participants with a self-reported UAP experience were provided with an open text box to describe what they witnessed. All of the accounts were reviewed and classified into categories. Most participants described one sighting, but some had up to four. Table 4 provides the percentages of sightings of different types of objects provided by AARO's cohort of data (U.S. Senate Committee Armed Services, 2023) comprised of military witnesses and compares these to the characterization of sightings

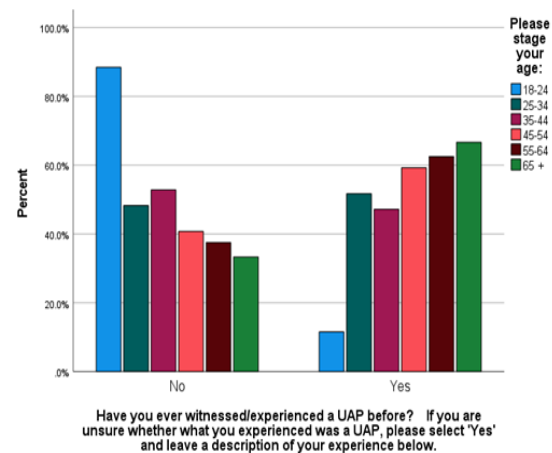
in this cohort. Approximately 56% of the sightings can be characterized as orb/round/sphere/star-like/lights, and this is comparable to the 60% observed in the AARO data. The frequencies for other shapes, such as triangles, discs, and cubes, are also comparable to the AARO data. For the uncharacterized group, these were accounts for which the shape wasn't noted or was undefinable to the observer. Examples of this included "small cloud changing direction at low altitude," "a woman changing appearance then floating off," "shapes transforming," and "massive object with three levels." For the category "other," these included other objects that were only mentioned once: cross, pyramid, donut-shaped, and a boomerang shape. Four of the participants reported witnessing some kind of non-human intelligence being.

**Predicting UAP Sightings**

Chi-square tests were performed to examine if UAP

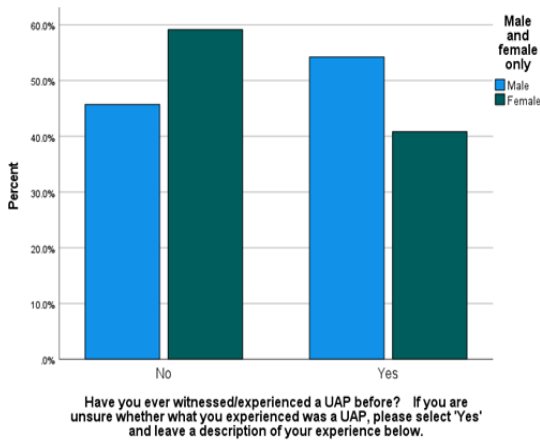


**Figure 1.** UAP sightings and Education.



**Figure 2.** UAP sightings and Age.





**Figure 3.** UAP sightings and Gender.

sightings vary by education (Figure 1), age (Figure 2), and gender (Figure 3). UAP sightings did not differ (Yes/No) across levels of education<sup>3</sup>  $\chi^2(6) = 5.53, p = .48$  – GCSE (12/5), A-Level (27/29), Bachelors Degree (33/32), Masters Degree (14/22), Doctoral Degree (5/6), Other (4/4), College/Diploma (8/5). UAP sightings did significantly differ across age categories  $\chi^2(5) = 20.77, p < .001$ , and inspection of the residuals indicated that fewer (11.5%) of 18-24-year-olds (3= Yes, 23= No) reported UAP sightings than other age groups: 25-35-year-olds (15/14, 51%), 35-44 year olds (25/28, 47%), 45-54-year-olds (32/22, 62%), and 65+ year olds (8/4, 66%). The frequency of UAP sightings did not significantly differ across genders:  $\chi^2(1) = 3.30, p = .07$  – male (Yes= 70 No= 59), female (29/42). People who have had a self-reported sighting of a UAP were statistically more likely to believe that alien visitation has occurred ( $r(204) = -.268, p < .001$ ), and more scientific research should be done ( $r(204) = -.142, p = .042$ ). In summary, UAP sightings did not differ by education or gender but are less frequently seen by the youngest age group, 18-24 year olds. Overall frequency and percentag-

es are provided in Table 5.

A logistic regression analysis was performed predicting UAP reporting from education, gender, and age. The dependent variable was UAP reporting, coded 1 for “yes” and 0 for “no”. The results (Table 6) indicated the overall model was not significantly better than a null model with no predictors  $\chi^2(8) = 6.294, p = .614$ , and none of the predictors were significantly related to UAP reporting.

### Correlations Between Personality Variables and Sightings

Each of the personality variables (Big-5 and schizotypy) and the subscales of the extra-terrestrial beliefs subscales were normally distributed. Having a sighting of a UAP was significantly correlated with higher scores on agreeableness ( $r = .152, p = .033$ ), conscientiousness ( $r = .195, p = .006$ ), neuroticism ( $r = -.221, p = .002$ ), and openness ( $r = .227, p = .001$ ) but these were weak correlations with significant personality traits only explaining 2.3%-5.1% of the variation in UAP sightings. UAP sightings and extraversion were not significant ( $r = .029, p = .685$ ).

A logistic regression analysis was performed predicting UAP sighting from big five personality variables and schizotypy (see Table 7). The dependent variable was having a UAP sighting, coded 1 for “yes” and 0 for “no”. The overall model with predictors was significantly better than a null model with no predictors,  $\chi^2(6) = 22.343, p < .001$ . The results indicated when controlling for one another, only neuroticism ( $b = -.44, p = .023$ ) and openness ( $b = .421, p = .013$ ) significantly related to having a UAP sighting (Tjur  $R^2 = 11.3%$ ) (Allison, 2014). Neuroticism is negatively related to having a UAP sighting (odds ratio = .644), meaning that for every 1 standard deviation increase in neuroticism, the odds of having a UAP sighting decrease by 35.6%. Openness is positively related to hav-

**Table 6.** Logistic Regression Predicting UAP Reporting from Education, Gender, and Age.

Predictor	b	Standard error	Wald	p	Exp(b) Odds Ratio	95% CI Odds Ratio
Intercept	-2.022	1.153	3.075	.080	.132	
Education: GCSE	.722	.818	.780	.377	2.059	[.415, 10.226]
Education: A-level	.639	.633	1.016	.313	1.894	[.547, 6.556]
Education: Masters	.539	.764	.498	.480	1.715	[.383, 7.670]
Education: doctoral	-19.802	20059.267	0	.999	.000	[0, ∞]
Education: other	1.301	1.106	1.384	.239	3.673	[.420, 32.085]
Education: college/diploma	-.474	1.191	.159	.690	.622	[.060, 6.428]
Gender	.27	.550	.242	.623	1.311	[.446, 3.850]
Age	.079	.203	.150	.698	1.082	[.727, 1.611]

Note. N=196. Dependent measure “UAP reporting” coded 0=no, 1=yes. The omitted reference category for the dummy coded education variables is bachelor’s degree. Gender coded 1=male, 2=female. \* $p < .05$ .

**Table 7.** Logistic Regression Predicting UAP Sighting from Personality and Schizotypy.

Predictor	<i>b</i>	Standard error	Wald	<i>p</i>	Exp( <i>b</i> ) Odds Ratio	95% CI Odds Ratio
Intercept	.008	.152	.003	.957	1.008	[.748, 1.359]
Extraversion	-.132	.177	.559	.455	.876	[.620, 1.239]
Agreeableness	.112	.169	.443	.506	1.119	[.804, 1.558]
Conscientiousness	.253	.173	2.134	.144	1.287	[.917, 1.807]
Neuroticism	-.440*	.193	5.190	.023	.644	[.441, .940]
Openness	.421*	.169	6.223	.013	1.524	[1.094, 2.121]
Schizotypy	.196	.202	.937	.333	1.216	[.818, 1.807]

Note. *N*=196. Dependent measure “UAP sighting” coded 0=no, 1=yes. \**p*<.05. Predictors are centered.

ing a UAP sighting (odds ratio = 1.524), meaning that for every one standard deviation increase in openness, the odds of having a UAP sighting increase 52.4%.

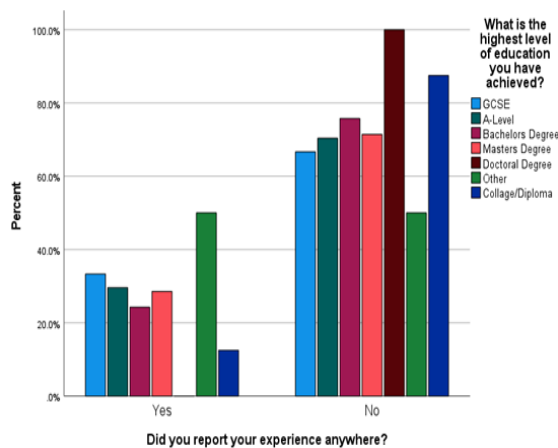
Because odds ratios reflect a ratio of odds ( $(p_1/q_1)/(p_2/q_2)$ ), and odds are also a ratio ( $p/q$ ) of an event occurring ( $p$ ) relative to an event not occurring ( $1-p: q$ ), the probability implications of odds ratios can be difficult to grasp (Lieberman, 2005). Additionally, odds ratios are often misinterpreted as direct estimates of changes in probabilities, which is incorrect (i.e., as risk ratios). Fortunately, odds ratios have direct relationships to probabilities and can be calculated using the logistic model assuming values for the predictors (Menard, 2001, p. 57).

Thus, the model results are more interpretable when expressed as probabilities, assuming values for the predictors. For someone who is average on all predictors, the probability of having a UAP sighting is 50.2%. For someone who has one standard deviation above the mean on neuroticism but is average on all other predictors, the probability of having a UAP sighting is 39.4%. For someone who has one standard deviation above the mean on openness but is average on all other predictors, the probability of having a UAP sighting is 60.6%. Overall, by comparing these probabilities, the results indicate a

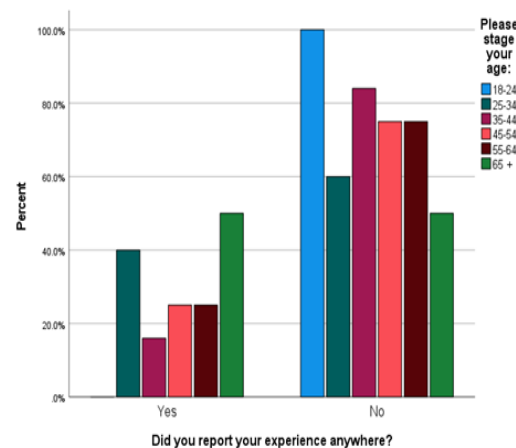
1 standard deviation increase in neuroticism decreases the probability of having a UAP sighting by 10.8%, and a 1 standard deviation increase in openness increases the probability of having a UAP sighting by 10.4%. Thus, despite the seemingly large odds ratios, when expressed as probabilities, its demonstrated personality has relatively modest relationships to the probability of having a UAP sighting.

UAP sightings were not significantly related to overall schizotypy ( $r = .066, p = .359$ ). With respect to the schizotypy subscales, people who have had a UAP sighting were significantly less likely to score higher on social anxiety ( $r = -.152, p = .034$ ) and the disorganized subscale ( $r = -.163, p = .023$ ). Cognitive-perceptual ( $r = .091, p = .206$ ) and interpersonal ( $r = -.108, p = .134$ ) subscales were not significant. Significantly related schizotypy traits only explained 2.3%-2.7% of the variation in UAP sightings, indicating these traits are also not strongly related to having a UAP sighting.

These findings suggest that people who have had sightings of UAP are more likely to be high in agreeableness, conscientiousness, and openness and lower in neuroticism, social anxiety, and disorganized traits, but these associations are not strong. Nevertheless, the higher

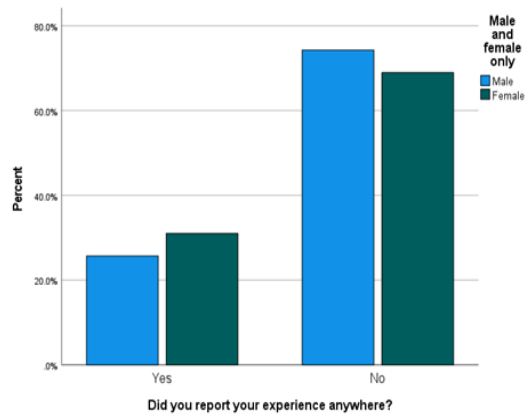


**Figure 4.** UAP Reporting and Education.



**Figure 5.** UAP Reporting and Age.





**Figure 6.** UAP Reporting and Gender.

someone is in openness and low in neuroticism, the more likely they are to have a sighting. Having a sighting of UAP was also associated with a significant weak correlation with a belief in alien visitation ( $r = .289, p < .001$ ) and belief in scientific search ( $r = .154, p = .027$ ), but it was not significant with a general belief in aliens ( $r = -.064, p = .364$ ). These findings suggest that having a sighting of a UAP is not a strong predictor of believing in aliens or thinking that further scientific research into the topic is needed.

**Predicting UAP Reporting**

Chi-square tests were performed to examine if UAP reporting varies by education (Figure 4), age (Figure 5), and gender (Figure 6). UAP Reporting did not differ across levels of education\*  $\chi^2(6) = 4.31, p = .64$  - GCSE (Yes [4], No [8]), A-Level (8/19), Bachelors Degree (8/25), Masters Degree (4/10), Doctoral Degree (0/5), Other (2/2), College/Diploma (1/7). UAP Reporting did not differ across age  $\chi^2(5) = 6.27, p = .28$  - 18-24-year-olds (Yes [0] No [3]), 25-34-year-olds (6/9), 35-44 year olds (4/21), 45-54-year-olds (8/24), 55-64-year-olds (5/15), 65+ year olds (4/4). UAP Reporting did not differ across gender  $\chi^2(1) = .29, p = .59$  - male (18= yes, 52= no), female (9/20). In summary, UAP reporting was not related to education, age, or gender.

**Latent Profile Analysis**

**Number of Latent Classes and Interpretation.** Latent profile analysis is a method for detecting unobserved profiles underlying clustering in observed item means and determining profile prevalence. For the present study, latent profile analysis was conducted using *Mplus 8* (Muthén & Muthén, 1998-2017) and estimated using maximum likelihood with robust standard errors (MLR) on six items: the Big Five variables (extraversion, agreeableness, neuroticism, conscientiousness, and openness) and schizotypy. Latent profile analyses have commonly been used with personality data (Espinoza et al., 2020) and have often found three or four profiles underlying Big Five measurements (Alessandri et al., 2014; Specht et al., 2014). As such, we expected a similar number of cluster solutions to underlie these items.

Latent profile analyses were conducted on the six items, extracting one through four class solutions. Best practice recommendations were followed to avoid unstable models with local likelihood maximums by requesting a sufficient number of start values in the first and second steps of optimization (500 and 50 sets, respectively) and using a sufficient number of initial stage iterations (50) (Geiser, 2013). All four class solutions replicated the best loglikelihood value, and the models were rerun with twice the random starts to check the best loglikelihood was still obtained and replicated. Next, the models were examined for a number of criteria (Table 5). The entropy statistic is a summary measure of the quality of classification, with higher values closer to 1 indicating better classification accuracy and lower values closer to 0 indicating lower classification accuracy. Heuristics recommend entropy values of  $\geq .60$  or  $\geq .80$ , but as there is no definitive entropy cutoff criterion (Muthén, 2008), the best model should be selected based on broad consideration of entropy with other criteria. All models had acceptably high entropy values.

More informative are the average latent class assignment probabilities (ALCP) for individuals who were assigned to a specific class. The ALCP matrix indicates the

**Table 8.** Latent Profile Analysis Results

Models	Entropy	ALCP			Class size % (n)				Model fit criteria		
		AL-CP-D	AL-CP-OD	Class 1	Class 2	Class 3	Class 4	BIC	aBIC	BLRDT	
1 Class	-	1.00	-	100% (196)	-	-	-	3389.329	3351.314	-	
2 Class	.687	.908	.092	45.8% (90)	54.2% (106)	-	-	3275.593	3215.402	LRD= 150.684, df=7, p<.001	
3 Class	.729	.882	.059	14.0% (25)	54.9% (112)	31.1% (59)	-	3275.048	3192.683	LRD= 37.491, df=7, p<.001	
4 Class	.788	.901	.033	50.2% (102)	16.1% (30)	30.9% (59)	2.8% (5)	3289.057	3184.517	LRD= 22.937, df=7, p=.022	

Note. N=196. ALCP = average latent class probability for most likely class membership. ALCP-D: average of the diagonal values. ALCP-OD: average of the off-diagonal values. BIC = Bayesian Information Criterion. aBIC = sample-size adjusted BIC. BLRDT = bootstrap likelihood ratio difference test.



quality of a latent profile analysis solution. Values close to 1 (i.e.,  $\geq .80$ ) on the diagonal of the ALCP matrix (ALCP-D) indicate a high precision of the classification because it indicates individuals, on average, are classified with high certainty into their most likely latent class. It is also desirable to have values close to 0 on the off-diagonal of the ALCP matrix (ALCP-OD) because it indicates individuals belonging to that class have a low probability of being assigned to another class (Geiser, 2013; Weller et al., 2020). The average ALCP-D and ALCP-OD are shown in Table 8. All models had high ALCP-D and low ALCP-OD, indicating all solutions had good classification accuracy.

Models were compared using fit criteria and model comparison tests (Table 2). Model fit criteria take into account the goodness of fit of a model to the data and model parsimony and weigh the best model as one that fits well and uses as few parameters as possible. Models with the smallest Bayesian Information Criterion (BIC) or sample-size adjusted Bayesian Information Criterion (aBIC) are preferred (Geiser, 2013). The BIC indicated the 3 class model, while the aBIC indicated the four class model, as the best performing model.

Models were next compared using the bootstrap likelihood ratio difference test (BLRDT) (Table 2). The BLRDT compares a model with  $G$  latent classes against a model with  $G-1$  classes, and a significant  $p$ -value indicates the model with  $G$  classes fits the data better than the more parsimonious model with one class less, while a nonsignificant  $p$ -value indicates the more parsimonious model with one class less is preferred. The BLRDT was used to compare 1 class to 2 classes ( $p < .001$ ), 2 classes to 3 classes ( $p < .001$ ), and 3 classes to 4 classes ( $p = .022$ ). In all comparisons, the model with more classes was preferred, with the BLRDT ultimately indicating the four class model as the best performing model.

In addition to the above descriptive and statistical criteria, it is also important to consider the size of the classes and the interpretability of the class solutions (Geiser, 2013; Weller et al., 2020). While the four-class model was indicated as better than the three-class model according to the aBIC and BLRDT, its fourth class had a very small membership 2.8% ( $n = 5$ ) which did not seem justifiable beyond a three-class solution. Therefore, upon considering all the above criteria, the three-class model was selected as the best model, and the one-, two-, and four-class models were not considered further.

Figure 7 presents a profile plot of the three-class solution and shows how the three classes differ in their estimated means for the six items. The figure indicates Class 2, which is the largest class with 54.9% of the sample, has values close to 0 across all items. Because the items were standardized, this indicates Class 2 is a cluster

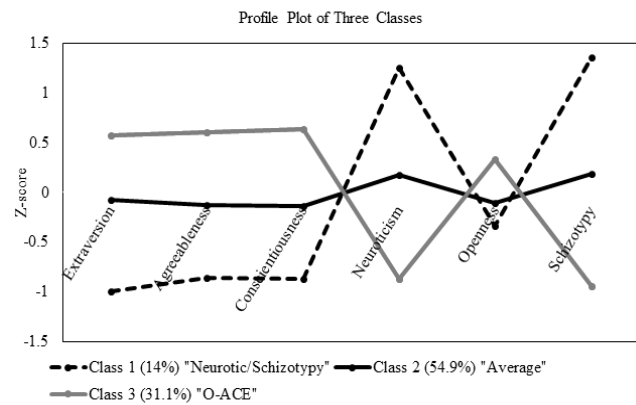


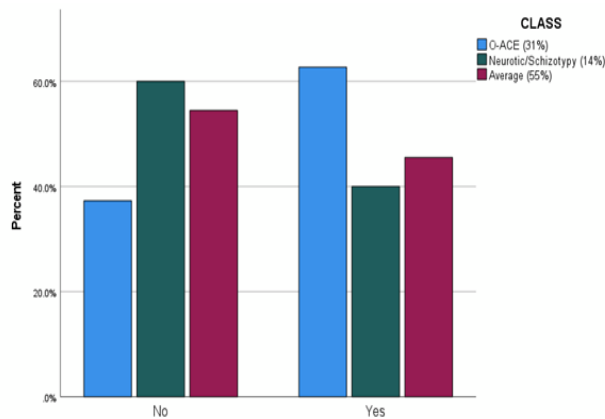
Figure 7. Profile Plot of Three Class Solution.

in which people score about average on all six items and thus reflects “average” people. The next largest class is Class 3, which accounts for 31.1% of the sample. This class is characterized by high extraversion, high agreeableness, high conscientiousness, low neuroticism, high openness, and low schizotypy, and so seems to reflect people with grounded, positive, open, resilient, and emotionally stable characteristics. The remaining class is Class 1, with 14% of the sample, is characterized by low extraversion, low agreeableness, low conscientiousness, high neuroticism, low openness, and high schizotypy, and so seems to reflect people who are temperamentally emotionally reactive, negative, closed, disorganized, and schizotypal. Overall, given the clusters most differ in neuroticism and schizotypy, these characteristics may distinguish Class 3 as “average”, Class 2 as “O-ACE”, and Class 1 as “Neurotic/Schizotypy.” All classes had significantly different means from each other, except for Class 1 “Neurotic/Schizotypy” and Class 3 “average” which had the same openness ( $p = .419$ ).

### Investigating Class Differences on UAP Outcomes

Group differences were examined for UAP sightings, UAP Reporting, Belief in Alien Visitation, Belief in Scientific Search, and General Alien Belief. Group differences in UAP outcomes were investigated using the BCH method, which is appropriate for continuous and binary outcomes and is recommended over the three-stage approach for avoiding shifts in latent class in the final stage (Asparouhov & Muthen, 2021). The results indicated the groups significantly differed in UAP sightings (Figure 8),  $\chi^2(2) = 6.01, p = .05$ . “O-ACE” group (Openness, Agreeableness, Conscientiousness and Extraversion) (64.9%) had significantly higher UAP sightings than “average” group (44.3%),  $\chi^2(1) = 4.38, p = .036$ , and nearly significantly higher UAP sightings than “neurotic/schizotypy” people (39.4%),  $\chi^2(1) = 3.708, p = .054$ . “average” and “neurotic/schizotypy”





**Figure 8.** Sightings and Personality Profiles.

group did not differ in their UAP sightings ( $p = .72$ ).

The groups did not significantly differ regarding UAP reporting  $\chi^2(2) = .87, p = .65$ . That is, for those who had a UAP sighting, “average,” “O-ACE,” and “Neurotic/Schizotypy” participants did not differ overall in their UAP reporting (20%, 30.5%, and 31.6%, respectively). Lastly, the groups did not significantly differ in Belief in Alien Visitation  $\chi^2(2) = 1.29, p = .53$ , nor Belief in Scientific Search  $\chi^2(2) = .84, p = .66$ , nor General Alien Belief  $\chi^2(2) = .36, p = .84$ . In summary, the “O-ACE” personality profile group reported more UAP sightings than the “average” group. The groups did not differ in their frequency of reporting UAPs nor their beliefs or attitudes about UAPs.

To test the generalizability of the results, we also repeated the class differences analyses on the two-class solution, which, while indicated as less optimal than the three-class solution, has more members per class and thus greater power to detect group differences. The two-class solution had two classes, and its profile plot largely resembled Figure 7, absent the “average” participants, who were now classified as either “O-ACE” (54.2%,  $n = 106$ ) or “Neurotic/Schizotypy” (45.8%,  $n = 90$ ). The results remained similar to the above with three classes; “O-ACE” people (62.7%) had significantly higher UAP sightings than “Neurotic/Schizotypy” people (35%)  $\chi^2(1) = 10.49, p < .001$ , but did not differ in UAP reporting  $\chi^2(1) = .03, p = .87$ , Belief in Alien Visitation  $\chi^2(1) = .42, p = .52$ , nor Belief in Scientific Search  $\chi^2(1) = .87, p = .35$ , nor General Alien Belief  $\chi^2(1) = 3.25, p = .08$ .

Multiple regressions were next performed using the three personality profile membership variables as predictors of the UAP outcomes. The overall regression models for all five outcomes were not significant (UAP sightings:  $\chi^2(2) = 5.75, p = .056$ , UAP Reporting:  $\chi^2(2) = .87, p = .65$ , Belief in Alien Visitation:  $F(2, 193) = .537, p = .59$ , Belief in Scientific Search:  $F(2, 193) = .385, p = .68$ , and General Alien Belief:  $F(2, 193) = .166, p = .85$ ). These null results indicate personality profiles do not explain a significant

amount of variance in the outcomes, nor significantly improve model fit beyond a null model. In other words, personality profiles do not seem to “explain” or “predict” UAP outcomes. These findings complement the latent profile analyses above, which found no significant mean differences in UAP outcomes between personality groups, aside from one significant group difference in UAP sightings; the O-ACE group reported higher UAP sightings than average people.

## DISCUSSION

To our knowledge, this is the first study to explore the statistical relationship between personality factors and UAP sightings. Firstly, the data indicated that what our participants observed was similar in description and frequency to what military and service personnel reported (Senate Committee Armed Services, 2023). Furthermore, only 14% of sightings get reported to a public database. We did not find that UAP sightings were predicted by education, which is in contrast to the findings of Swami et al. (2011), who found that those who believe in extraterrestrials were likely to be less educated. This could be because Swami et al. had almost twice the sample size of this study and were more able to detect significant small effects, or it could be that education predicts belief, but it does not predict the likelihood of having a sighting. Similar to Swami et al., we found that gender did not predict UAP sightings. Our findings did indicate that younger people were less likely to have seen a UAP. However, this could be somewhat an effect of length of life exposure; the older someone is, the greater the chances that they may have seen something anomalous over the course of their life. Swami et al. found that people who are high in openness are more likely to believe in UAP, and we also found that people who are high in openness are more likely to report having seen a UAP. However, we also found that participants with a sighting were more likely to be high in extraversion, openness, conscientiousness, and agreeableness but low in neuroticism. Unlike Swami et al., (2011), we found that people’s schizotypy traits were not predictive of having had a sighting overall. Again, this points to the characteristics that predict belief in UAP, which may not be the same characteristics that predict having had a self-reported sighting of a UAP.

People who self-reported having had a sighting of a UAP were more statistically likely to believe that alien visitation has occurred and more scientific research should be done, but this was not a strong association. This suggests that for some people who have had a sighting, it has convinced them that a non-human intelligence is self-evident and further research should be done, but for

others, they have not been convinced by that conclusion. It is possible that they think there still could be other explanations, such as advanced secret terrestrial technology not shared with the public. In either case, the stereotype that UAP experiencers generally and easily assume that what they saw must be something controlled by a non-human intelligence is not evident in our data; many are very critical of what they think they have seen.

The data also revealed that the participants could be classified into the following groups: O-ACE witnesses (high on openness, agreeableness, conscientiousness, and extraversion but low on neuroticism and schizotypy), the 'average' group (approximately average on each of the individual differences scales), and the Neurotic/Schizotypy group (low on extraversion, agreeableness, conscientious but high on neuroticism and schizotypy). The temperamentally stable and outgoing group were statistically more likely to have sightings than the 'average' group and almost significantly more than the Neurotic/Schizotypy group. The three groups of people didn't significantly differ in their reporting behavior or their belief in alien visitation, scientific research, and general alien belief. Our data indicates that people who are highly extroverted, agreeable, open, and conscientious yet emotionally calm and perceptually grounded are more likely to have sightings. This finding is contrary to the negative stereotype that it is people who are temperamentally primed to negative emotion (neurotic) and vulnerable to perceptual and cognitive abnormalities that have sightings.

The wider implications of the data are that a diverse array of personality types see UAP, but it is the temperamentally calmer, and more open individuals who are more likely to self-report having had a sighting. The stereotyped personality profiles do exist in the data: the anxious skeptic/debunker and the eccentric UAP experiencer, but neither of these are the norm across the UAP experiencer and non-experiencer groups, and personality profiles as a set are not significant predictors of UAP outcomes. The data suggest UAP sightings and beliefs are held by all types of people: average, stable, and Neurotic/Schizotypy profile individuals and group differences seem nonexistent or small. Additionally, personality profiles as a set were not significantly related to UAP outcomes or beliefs, which suggests these sightings, beliefs, and attitudes cannot be reductively explained by personality (e.g., motivated cognition). Overall, on average, most people have a relatively 'average personality profile, and some of those people see UAP. Our data suggests that people who are more prone to negative emotion and perceptual disturbances are not the typical personality profile presentation pertaining to experiencers. Those kinds of people tend not to see UAP. Furthermore, the stigma about this

topic needs to be reduced not just because the refusal to report observations may compromise public and military flight safety, but it should also be dropped because the current data indicates that it is all kinds of people see UAP, and many witnesses have several admirable traits, such as openness, conscientiousness, agreeableness, and extraversion. Our data suggests that self-reported UAP sightings cannot be primarily explained by a particular personality profile. There is not a 'certain kind of person' that sees UAP, it is all walks of life, but it does seem that some kinds of people are more open to recognizing and sharing their experience than others.

## Limitations

Despite the meaningful and informative findings of this study, there are several limitations. The data was collected via Twitter (now referred to as X), and it is possible that the kinds of people who are interested in following the topic on social media are already distinctly different from the rest of the population not interested in UAP and not following this topic. This could explain why approximately half the sample had sightings rather than what is expected in the general population of about 7% (Nolsoe, 2021). However, this study was focused on whether or not UAP sightings were predicted by personality rather than comparing those who are open to this topic versus those who are not. Therefore, it could be considered a strength that the participant pool included people who were already interested in the topic but didn't have sightings. The sample did not include people who have no access to a computer/Internet or who were illiterate; therefore, it is unclear if people from extremely low socioeconomic backgrounds display similar trends. But given that the spread of the Big-5 personality structure is consistent across socioeconomic backgrounds, this is unlikely to be a factor of note (Hughes et al., 2021). Both age and education type were collected as categorical variables, and future research should collect age as a continuous variable and education as a total number of years of education as opposed to degree types that may not equate across countries.

There may have also been a self-selection bias at play when using a sample from Twitter/X. It could be that when people higher in extroversion, conscientiousness, and openness have a sighting of a UAP, they then join online social media groups because they are conscientious and open nature, whereas people low in conscientiousness and openness might have sightings and not join any groups. It could also be that people high in neuroticism are more likely to be indoors and, therefore, less likely to see objects in the sky. If a much larger sample had been

obtained, then it would have been possible to control and match demographic characteristics and see if differences in personality profiles emerged that were a function of demographics. However, control matching is not ideal, and future research should consider using socially and geographically stratified participant populations to get a fully representative sample to rule out selection bias and expand the array of possible analyses that can be conducted.

It may have been better to use the NEO (Costa & McCrae, 1992) rather than the Big-5 measure (John et al., 1991), and if this study is replicated, that should be considered. The schizotypy measure used (Davidson et al., 2016) is better suited to those who might score on an abnormal level of personality pathology. Therefore, it could be argued that the O-Life (Mason et al., 1995) might have been a better measure for use in the general population. Gullibility and suggestibility were not measured in this study and could be considered in future research to see how much these characteristics and tendencies predict sightings of UAP above and beyond personality variables. A bigger cohort of participants would have been preferred, and under such circumstances, it is likely that the difference between the 'Average' and the Neurotic/Schizotypy groups might have been significant. All other effect sizes were small and suggested that increasing the sample size might not have led to significance. Greater detail and methodological rigor in the collection of UAP accounts will also be advised in the future.

Another limitation of the present study is its potentially low sample size. The sample size is an evolving area of study in the latent class analysis literature, and often the heuristic, as with SEM, is "the more, the better" (Weller et al., 2020). Nylund-Gibson and Choi (2018) recommend 300+ cases but observe that smaller samples may be adequate with simpler models (fewer indicators and classes) and "well-separated classes." The smaller sample size used in the present study is arguably adequate as it meets these criteria: the latent class model was relatively simple with only six indicators, the clusters had well-defined separation and modeled a relatively small number of clusters commonly found using big five data. Also, when the sample size is problematically low, some problems that arise are poor functioning fit indices, convergence failures, and failure to uncover classes with low memberships (Nylund-Gibson & Choi, 2018). The present study had none of these issues in its latent class analyses: fit indices were adequately high, there was model convergence, and the classes had all relatively large memberships (no class had small memberships, e.g., < 5%), all of which reasonably support the sample size's adequacy. That being said, the study results would

be strengthened using a larger sample size and directly replicating the latent cluster results with another, larger sample.

The quality of UAP accounts could have been better assessed for credibility if more information and details were collected about the people and accounts given. However, for the purposes of this study, the descriptions were sufficient and were the most unobtrusive option for participants. It is entirely possible that the 103 participants with UAP sightings could be explained by any combination of the following: false memories, misperception of the event, lies, taking another's story as their own, perceiving the event in the context of substance abuse, embellished their accounts or any other of the numerous potential reasons for falsely describing what they did. The status quo position across the majority of the scientific community is that their descriptions must be intentionally or unintentionally false accounts of what occurred. The null hypothesis is that UAP cannot be due to anything other than a terrestrial explanation, such as advanced human technology or a misunderstanding due to their personal psychology at the time of the observation or something miss misremembered after the original prosaic event.

The authors of this study cannot assert that all or any of the participant's accounts are verifiably true events. Therefore, we cannot confidently state that any of our participants actually saw a 'real' UAP that was not made by human hands. But in light of the recent credible congressional testimony under oath (Committee on Oversight and Accountability, 2023), the seriousness in which the topic is now being openly taken at the highest levels of U.S. government, and the sheer volumes of new and historical sightings coming to light, it might be time for the scientific community to give the majority of UAP experiencers the benefit of the doubt and examine this issue as though the alternative hypothesis could be true. That stance does not negate the vital need for more research capable of explaining UAP encounters as terrestrial prosaically explainable ones, but assuming that the null hypothesis is a fact may stymie scientific exploration and prevent people who have truly anomalous experiences from coming forth to be studied in good faith by the scientific community. Hence, the lack of screening for UAP witness credibility and validity in this sample is a limitation, but the collection of the data was done in good faith with the participants, and it has become reasonable to consider that the alternative hypothesis could be true and that these witnesses may have actually seen something fundamentally anomalous worthy of study.

## Implications

The primary implication of the data is that we need to reduce the stigma about seeing and reporting on UAP because all kinds of people see UAP, including very emotionally stable, outgoing, and conscientious people. High openness and extraversion traits might increase the chances of someone thinking that they have seen a UAP, but such traits account for a small amount of the variance in the data and don't explain most UAP sightings. Most cases (86%) do not get reported and logged in any UAP database, which means that it is difficult for the scientific community to understand the extent of the UAP issue.

Standardized public reporting mechanisms also need to be developed by an educated panel that can agree on what data/details need to be collected when there are allegations of a UAP sighting. Most reporting centers collect slightly different information, which can make it hard to collate and compare data sets. The National UFO Reporting Centre receives approximately 3,500-7,000 reports a year, giving an average of about 5000 (Dolan, 2022). Although that sample is primarily based in America, if only 14% of UAP sightings are ever reported, then that must mean there are approximately 35,000 sightings a year in the areas for which they receive data. Even if one assumes that half of the sightings are objectively false for numerous potential reasons, then that still leaves 17,500 sightings a year, which does not include all the other potential locations that may also have sightings.

Witnessing a UAP might be rare statistically given the comparative size of the global population but the frequency of sightings is still substantial enough that collectively they are difficult to ignore and potentially represent a body of data worthy of further investigation. Answers to the biggest questions for humanity cannot be answered by any one single anecdote or even a collection of them. However, with that many anecdotes, a hypothesis begins to form that needs testing. Are we alone, or are we not? It is about time that scientists of all disciplines and public inquiry develop a tangible understanding of this issue. But if the null hypothesis is true, that we are alone for now, then that seems like an equally difficult proposition to prove given the frequency of allegations by credible witnesses at congressional hearings, the sheer volume of sightings that occur, and the 'averageness' of the people observing them.

## CONCLUSION

People who report witnessing a UAP are not, on average, much characteristically different from those who have not seen a UAP. There is, however, a greater chance that people who admit to having seen UAP will be extraverted, conscientious, open, and agreeable but low on

neuroticism and vulnerability to abnormal perception. Most UAP sightings are not reported, and therefore, there is an information gap regarding the true extent and diversity of these experiences. The general public reports seeing UAPs that are very similar to what military and service personnel report. The UAP issue represents a very current and perplexing scientific mystery that is worthy of further exploration, and the psychological sciences should take a leading role in unraveling this topic.

## ENDNOTES

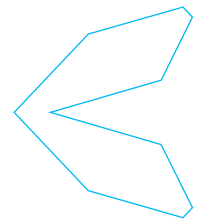
- 1 "Other" was a category for types of education that did not fit into the college/diploma category, such as a guild or apprenticeship.
- 2 Fourteen sightings were reported to the UFO/UAP organization out of the 103 witnesses. These groups report on the total number of sightings. Thus, this figure has more relevance for interpreting the wider yearly statistics presented by groups such as MUFON and NUFORC rather than using the total sample size of places people reported to.
- 3 The following are United States equivalent years of education: GCSE= 10<sup>th</sup> Grade, A-Level= 12<sup>th</sup> Grade, Bachelor's degree= 3 years of additional education (15 years total), Masters Degree= 1 year of additional education (16 years total), Doctoral level = 3-5 years of additional education (19-21 years total), Collage/ diploma= 13-15 years total.

## REFERENCES

- Ahmadi, M., Moradi, A. R., Esmaeili, A. T., Mirabolfathi, V., & Jobson, L. (2019). A preliminary study investigating time perception in adolescents with posttraumatic stress disorder and major depressive disorder. *Psychological Trauma, 11*(6), 671-676. <https://doi.org/10.1037/tra0000471>
- Alessandri, G., Vecchione, M., Donnellan, B. M., Eisenberg, N., Caprara, G. V., & Cicciuch, J. (2014). On the cross-cultural replicability of the resilient, undercontrolled, and overcontrolled personality types. *Journal of Personality, 82*(4), 340-353. <https://doi.org/10.1111/jopy.12065>
- Allison, P. D. (2014, March). Measures of fit for logistic regression. In *Proceedings of the SAS Global Forum 2014 Conference* (pp. 1-13). SAS Institute Inc.
- Asan, A. E., & Pincus, A. L. (2023). Examining schizotypal personality scales within and across interpersonal circumplex surfaces. *Assessment, 30*, (7) 2296-2317. <https://doi.org/10.1177/10731911221143354>
- Asparouhov, T., & Muthén, B. (2021). Auxiliary variables in mixture modeling: Using the BCH method in Mplus

- to estimate a distal outcome model and an arbitrary secondary model. *Mplus Web Notes*, 21(11), 1-80.
- Clancy, S. A. (2005). *Abducted: How people come to believe they were kidnapped by aliens*. Harvard University Press. <https://doi.org/10.4159/9780674029576>
- Committee on Oversight and Accountability. (July 26, 2023). Subcommittee on National Security, the Border, and Foreign Affairs Hearing. GOP Oversight [Video] YouTube. <https://www.youtube.com/watch?v=KQ7Dw-739VY&list=PLK-tW3acb-qCzZ5cWKRdZH-pqwhjcSfI3F&index=101&t=1415s>
- Compass Prose Legal Group (May 25, 2023). ODN: Intelligence Community Inspector General. Disclosure of Urgent Concern(s) Complain of Reprisal: In Re: David C. Grush GS-15 Civilian, NGA. Compass Rose Legal Group, PLLC.
- Connors, M. H. (2015). Hypnosis and belief: A review of hypnotic delusions. *Consciousness and Cognition*, 36, 27-43. <https://doi.org/10.1016/j.concog.2015.05.015>
- NOT CITED** Cooper, H., Blumenthal, R., & Kean, L. (2017a, December 16). Glowing auras and 'black money': The Pentagon's mysterious U.F.O program. *The New York Times*. <https://www.nytimes.com/2017/12/16/us/politics/pentagon-program-ufo-harry-reid.html>
- Cooper, H., Kean, L., & Blumenthal, R. (2017b, December 16). 2 Navy Airmen and an object that 'accelerated like nothing I've ever seen'. *The New York Times*. <https://www.nytimes.com/2017/12/16/us/politics/unidentified-flying-object-navy.html>
- Costa, P. T., & McCrae, R. R. (1992). *Neo Personality Inventory: Professional manual*. Psychological Assessment Resources.
- Davidson, C. A., Hoffman, L., & Spaulding, W. D. (2016). Schizotypal personality questionnaire – brief revised (updated): An update of norms, factor structure, and item content in a large non-clinical young adult sample. *Psychiatry Research-Neuroimaging*, 238, 345-355. <https://doi.org/10.1016/j.psychres.2016.01.053>
- CITED AS DOLAN** Doland, R. (September 14, 2022). How many UFO's are there really? Richard Doland Intelligent Disclosure [Video]. YouTube. <https://www.youtube.com/watch?v=oKSpUjGzcNQ&t=2453s>
- Espinoza, J. A., Daljeet, K. N., & Meyer, J. P. (2020). Establishing the structure and replicability of personality profiles using the HEXACO-PI-R. *Nature Human Behaviour*, 4(7), 713-724. doi:10.1038/s41562-020-0853-6
- Geiser, C. (2013). *Data analysis with Mplus*. Guilford Press.
- House Intelligence. (2022, May 17). Open c3 subcommittee hearing on unidentified aerial phenomena [Video]. YouTube. <https://www.youtube.com/watch?v=aS-DweUbGBow&list=PLKtwW3acbqCzZ5cWKRdZH-pqwhjcSfI3F&index=77&t=4863s>
- Hughes, B. T., Costello, C. K., Pearman, J., Razavi, P., Bedford-Peterson, C., Ludwig, R. M., Srivastava, S. (2021). The big five across socioeconomic status: Measurement invariance, relationships, and age trends. *Collabra: Psychology*, 7(1), Article p24431. <https://doi.org/10.1525/collabra.24431>
- JASP Team. (2023). JASP (V. 0.17.3) [Computer software].
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). Big Five Inventory [Dataset]. In *PsycTESTS Dataset*. <https://doi.org/10.1037/t07550-000>
- Kang, Hur, N., Lee, S., & Yoshikawa, H. (2008). Horizontal parallax distortion in toed-in camera with wide-angle lens for mobile device. *Optics Communications*, 281(6), 1430-1437. <https://doi.org/10.1016/j.optcom.2007.11.016>
- Kappes, A., Harvey, A. H., Lohrenz, T., Montague, P. R., & Sharot, T. (2020). Confirmation bias in the utilization of others' opinion strength. *Nature Neuroscience*, 23(1), 130-137. <https://doi.org/10.1038/s41593-019-0549-2>
- Kean, L., & Blumenthal, R. (2023). Intelligence official says U.S. has retrieved craft of non-human origin. Debrief Media. <https://thedebrief.org/intelligence-officials-say-u-s-has-retrieved-non-human-craft/>
- Lange, R., & Thalbourne, M. A. (2002). Rasch scaling paranormal belief and experience. Structure and semantics of Thalbourne's Australian Sheep-Goat Scale. *Psychological Reports*, 91, 1065-1073. <https://doi.org/10.2466/pr0.2002.91.3f.1065>
- Lieberman, A. M. (2005). How much more likely? The implications of odds ratios for probabilities. *American Journal of Evaluation*, 26(2), 253-266. <https://doi.org/10.1177/1098214005275825>
- Loftus, E. F. (2003). Make-believe memories. *American Psychologist*, 58, 867-873. <https://doi.org/10.1037/0003-066X.58.11.867>
- Mason, O., Claridge, G., & Jackson, M. (1995). New scales for the assessment of schizotypy. *Personality and Individual Differences*, 18, 7-13. [https://doi.org/10.1016/0191-8869\(94\)00132-C](https://doi.org/10.1016/0191-8869(94)00132-C)
- McGaugh, J. L. (2003). *Memory and emotions: The making of lasting memories*. Columbia University Press.
- McNally, R. J., & Clancy, S. A. (2005). Sleep paralysis, sexual abuse, and space alien abduction. *Transcultural Psychiatry*, 42(1), 113-122. <https://doi.org/10.1111/j.0956-7976.2004.00707.x>
- McNally, R. J., Lasko, N. B., Clancy, S. A., Macklin, M. L., Pitman, R. K., & Orr, S. P. (2004). Psychophysiological responding during script-driven imagery in people reporting abduction by space aliens. *Psychological*

- Science*, 15(7), 493–497
- Menard, S. (2001). *Applied logistic analysis, Quantitative applications in the social sciences series #106*. Sage Publications.
- Moskowitz, Dorahy, M. J., & Schäfer, I. (2019). *Psychosis, Trauma and Dissociation: Evolving perspectives on severe psychopathology*. John Wiley & Sons, Incorporated. <https://doi.org/10.1002/9781118585948>
- Muthén, B. O. (2008). What is a good value of entropy? <http://www.statmodel.com/discussion/messages/13/2562.html?1487458497>
- Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus user's guide* (8th ed.). Author.
- NASA Video. (2023, May 31). Public Meeting on Unidentified Anomalous Phenomena. [Video] YouTube. <https://www.youtube.com/watch?v=bQo08JRY-OiM&list=PLKtwW3acb-qCzZ5cWKRdZHpqwhjcS-fl3F&index=96&t=12557s>
- Nolsoe, E. (2021). Half of Britons think aliens exist – and 7% claim to have seen an UFO. YouGov. <https://yougov.co.uk/topics/politics/articles-reports/2021/06/25/half-britons-think-aliens-exist-and-7-claim-have-s>
- Nylund-Gibson, K., & Choi, A. Y. (2018). Ten frequently asked questions about latent class analysis. *Translational Issues in Psychological Science*, 4(4), 440-461. <https://doi.org/10.1037/tps0000176>
- Office of the Director of National Intelligence. (2021, July 25). Preliminary Assessment: Unidentified Aerial Phenomena. <https://www.dni.gov/files/ODNI/documents/assessments/Prelimar-Assessment-UAP-20210625.pdf>
- Office of the Director of National Intelligence. (2022, January 12). 2022 Annual Report on Unidentified Aerial Phenomena. <https://www.dni.gov/files/ODNI/documents/assessments/Unclassified-2022-Annual-Report-UAP.pdf>
- Preece, P., & Baxter, J. H. (2000). Scepticism and gullibility: the superstitious and pseudo-scientific beliefs of secondary school students. *International Journal of Science Education*, 22(11), 1147–1156. <https://doi.org/10.1080/09500690050166724>
- Qualtrics. (2023). Provo, Utah, USA, used March 2023. <https://www.qualtrics.com>
- Robertson, D. J. (2013). *The Practice of Cognitive-Behavioural Hypnotherapy: A manual for evidence-based clinical hypnosis* (1st ed.). Routledge. <https://doi.org/10.4324/9780429482793>
- Robin, F., Bonamy, J., & Ménétrier, E. (2018). Hypnosis and false memories. *Psychology of Consciousness*, 5(4), 358–373. <https://doi.org/10.1037/cns0000150>
- Sharpless, B., & Doghramji, K. (2015). Diagnostic criteria, diagnostic issues, and possible subtypes of sleep paralysis. In *Sleep paralysis*. EDITORS (pp. 147-152) Oxford University Press. <https://doi.org/10.1093/med/9780199313808.003.0011>
- Specht, J., Luhmann, M., & Geiser, C. (2014). On the consistency of personality types across adulthood: latent profile analyses in two large-scale panel studies. *Journal of Personality and Social Psychology*, 107(3), 540-556. <https://doi.org/10.1037/a0036863>
- Stubbings, D. R. (March 16, 2023). [Twitter] [https://twitter.com/Dr\\_Stubbings/status/1636246918375374848?s=20](https://twitter.com/Dr_Stubbings/status/1636246918375374848?s=20)
- Swami, V., Furnham, A., Haubner, T., Stieger, S., & Voracek, M. (2009). The truth is out there: The structure of beliefs about extraterrestrial life among Austrian and British respondents. *Journal of Social Psychology*, 149(1), 29–43. <https://doi.org/10.3200/SOCP.149.1.29-43>
- Swami, V., Pietschnig, J., Stieger, S., & Voracek, M. (2011). Alien psychology: Associations between extraterrestrial beliefs and paranormal ideation, superstitious beliefs, schizotypy, and the Big Five personality factors. *Applied Cognitive Psychology*, 25(4), 647-653. <https://doi.org/10.1002/acp.1736>
- Unidentified Anomalous Phenomena Disclosure Act of 2023, U.S.C. § 2226 (2023)
- U.S. Senate Committee Armed Services. (April 19, 2023). Subcommittee on emerging threats and capabilities. Open/closed: To receive testimony on the mission, activities, oversight, and budget of the all-domain anomaly resolution office. Open/Closed: To receive testimony on the... | U.S. Senate Committee on Armed Services
- Weller, B. E., Bowen, N. K., & Faubert, S. J. (2020). Latent class analysis: A guide to best practice. *Journal of Black Psychology*, 46(4), 287-311. <https://doi.org/10.1177/0095798420930932>
- Wiseman, R., & Watt, C. (2004). Measuring superstitious belief: Why lucky charms matter. *Personality and Individual Differences*, 37(8), 1533-1541. <https://doi.org/10.1016/j.paid.2004.02.009>
- Worrell F. C., & Cross W. E., Jr. (2004). The reliability and validity of Big Five Inventory scores with African American college students. *Journal of Multicultural Counseling and Development*, 32(1), 18–32. doi: 10.1002/j.2161-1912.2004.tb00358.x.



RESEARCH  
ARTICLE

# Impact of Meditation Versus Exercise on Psychological Characteristics, Paranormal Experiences, and Beliefs: Randomized Trial

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## INTRODUCTION

The field of meditation research has grown exponentially in the past two decades, driven largely by a growing appreciation of the potential for contemplative practices to affect psychophysiological functioning positively, re-

duce stress, and increase emotional and physical well-being (Goyal et al., 2014; Khoury et al., 2013). This body of research has shed light on the effects of meditation practices on basic mechanisms of attention, perception, and cognition, among other things (Chiesa et al., 2011; Fox et al., 2014). Studies investigating neural correlates of life-

## HIGHLIGHTS

Participants in a meditation program reported more mindfulness, extroversion, connectedness, and paranormal beliefs and experiences over time than those in a similarly structured exercise intervention.

## ABSTRACT

**Background:** Research indicates that meditation increases mindfulness and paranormal experiences of precognition, telepathy, clairvoyance, and synchronicities. There is limited knowledge about the prevalence or impact of these experiences on meditators and the general population. **Aims:** To compare self-reported well-being, mindfulness, connectedness, personality, paranormal experiences, beliefs, and performance on psi tasks in a meditation group versus an exercise control group. **Method:** This is a randomized trial that explored changes, including well-being, mindfulness, connectedness, psi, extraordinary experiences, beliefs, and ability to impact a random number generator in the participants, comparing a meditation vs. exercise control group. We collected data at baseline, “Mid” or halfway through the intervention (week 4), post 1, which is at the end of intervention (week 9), and post 2, which is two months post-intervention. Data was collected securely online with IRB approval. **Results:** Data from 72 participants ( $N = 45$  meditation/ $N = 27$  exercise) demonstrated improvement in some well-being measures (anxiety and general health). The study examined the effects of meditation versus exercise on various psychosocial measures and paranormal experiences. The meditation group displayed higher scores in openness and extroversion compared to the exercise group, which was unexpected and required further investigation. The meditation cohort also reported more paranormal experiences, with about half of them considering these experiences important or meaningful. However, the experiment exploring psychic abilities did not yield significant results. While the study had limitations, such as a predominantly non-diverse sample, it adds to the existing body of evidence linking meditation and exercise to positive psychosocial outcomes. **Conclusions:** The randomly selected meditation naïve cohort trained in brief structured meditation demonstrated increases over time in mindfulness, connectedness, extraversion, and paranormal experiences and beliefs compared to an exercise cohort. Psi performance did not improve in either group over time, and these tasks may not be sensitive enough to detect significant changes.

## KEYWORDS

Meditation, mindfulness, paranormal experiences, psi beliefs, training programs.



time meditation practice (Boccia et al., 2015; Fox et al., 2016), as well as changes in brain function and structure associated with short-term mindfulness interventions (Hölzel et al., 2011), have led to a robust new field of contemplative neuroscience. The literature regarding meditation is challenged by the fact that the research area still lacks clear definitions and descriptions of what is meant by the term meditation. In this manuscript, we specifically define meditation as well-being practices that focus on increasing awareness, connection, insight, and purpose using Vipassanā practices from the Theravada tradition in Buddhism (Lama, 2005).

An increasing body of literature indicates that the practice of meditation, as described above, appears to help alleviate a variety of stress-related conditions, enhancing people's positive qualities and improving overall quality of life (Chiesa, 2010; Singh et al., 2019). Many of these meditative practices were originally intended to help achieve enlightenment and ultimately allow the practitioner to achieve extraordinary powers or abilities. The classic yoga text known as Patanjali's *Yoga Sutras* (Satyananda Saraswati, 2000) states that when one attains the state of consciousness known as *Samadhi*, the *siddhis* or psychic powers manifest. Traditional Buddhist texts also state that upon attaining a certain level of enlightenment, the "super knowledge" manifests itself. Fuller discussions of Patanjali's *Yoga Sutras* concerning psi research have been given by Braud (2008) and Radin (2013) and support the idea that deep meditation abilities can facilitate psi and extraordinary experiences, including feelings of connection and oneness, openness to new ideas, and expansive positive emotions and compassion. These aspects of meditation experience and practice remain insufficiently examined in modern research studies involving meditation instruction. Experiences of oneness and interconnectedness; *Samadhi* and *siddhis*; *Shakti* and kundalini energies; spiritual transmission from teacher to student; past-life recall and reincarnation experiences; visions, synchronicities, precognition, extra-sensory perception; experiences of God, deities, and other non-physical entities; difficult stages of meditation, painful processes that can arise, and periods of disorientation and depersonalization are all described in the traditional texts and teachings of most contemplative traditions, but are rarely studied.

The anecdotal, survey, and interview data indicate that extraordinary aspects of meditation such as those described above may be important mediators by which meditation leads to beneficial outcomes and may be viewed as valuable to the individual in and of themselves (Vieten et al., 2006, 2008). Roney-Dougal et al., (2008) and Roney-Dougal and Solfvín (2011) conducted a series

of studies with meditation students, monks, Tibetan Lamas and Rinpoches, and found a significant relationship between the amount of lifetime meditation experience and performance on psi tasks. A recent survey conducted by the Institute of Noetic Sciences (IONS) (Vieten et al., 2018) found that a large proportion of people who meditate subjectively reported having had experiences of precognition such as telepathy, clairvoyance, and other psychic abilities, as well as increased synchronicities, memories of past lives, and out-of-body experiences. This retrospective study examined 1120 respondents with an average of 14 years of meditation practice, who reported psychological health in alignment with population norms, and found that over 50% reported "many times" or "almost always" having extraordinary experiences, such as experiences of timelessness and increased synchronicities. Over half reported experiencing clairvoyance or telepathy at least 2-5 times or more during their meditation practice. When asked how meaningful or important these experiences were, 60% of respondents said "quite a bit" or "very much," and another 20% responded "somewhat." Radin and Vieten and their team (2011) also demonstrated that meditators with a long history of meditation practice performed better on psi-related tasks than those with minimal experience.

In another study, Radin et al. (2012) found that meditation experience was positively associated with the effects of attention directed toward a double-slit apparatus on perturbations in the double-slit interference pattern, indicating that meditation experience may increase the so-called "observer effect." The observer effect is the phenomenon when an observed situation or phenomenon is changed just by the act of observing. Observer effects are especially prominent in physics, where observation and uncertainty are fundamental aspects of modern quantum. However, these results have not been able to be reproduced (Walleczek & von Stillfried, 2019). More recently, Penberthy et al. (2020) demonstrated in a two-arm nonrandomized study that meditation-naïve respondents enrolled in an active meditation group reported a higher average total number of psi experiences at the end of training compared to a control group who did not meditate (4.92 vs. 3.14,  $p = 0.0322$ ).

Based on this promising but preliminary data, we propose to add to the research by conducting a randomized controlled prospective trial in which participants are randomly assigned to either an intensive meditation group or an exercise control group that does not involve meditation but controls for time and engagement. This design helps us further explore the prevalence of specific experiences, including extraordinary experiences and psi abilities in both populations and over time, and the en-



dorsed impact of such experiences or abilities upon the individuals experiencing them. Additionally, we examine the real-time impacts of group meditation on a random number generator as an example of extraordinary psi abilities of the groups. Experiments using truly random number generators (RNGs) have reportedly demonstrated anomalous deviations in various group settings, including group meditations (Radin & Patterson, 2007), but this finding has not been consistent (Williams, 2021). According to research by Nelson et al., 2002, group meditations have a greater possibility of producing deviations or variance in true RNG outputs (Nelson et al., 2002). Additional research has also yielded positive results when comparing time-synchronized group meditation versus non-synchronized meditation (Nelson et al., 1997).

The current study examined the impact of an intervention to teach and practice structured Theravada tradition-based meditation versus the impact of a time equivalent structured physical exercise intervention upon individuals' well-being, mindfulness, connectedness, extraordinary or transformational spiritual experiences and beliefs, and abilities concerning impacting the random number generator. We examined participants who endorsed no significant prior history of meditation and randomly assigned them to a meditation instruction and practice or an exercise intervention that involved comparable virtual interaction and amount of time but did not provide meditation instruction or practice. This study allowed us to examine, more rigorously, the impact of our practices on these measured outcomes. The mindfulness, connectedness, and extraordinary or transformational experiences and beliefs are hypothesized to be significantly more improved in the meditation group versus the exercise group. We also hypothesized that the meditation cohort would endorse significantly more paranormal and psi experiences and increased belief in psi and paranormal experiences over time as compared to the exercise control group, and we examined the impact of both groups' meditations on a random number generator, in order further to explore the impact of meditation on psi abilities. We also explored the self-reported impact of the intervention in both groups and hypothesized it to be more important and meaningful in the meditation group.

## METHODS

### Trial Design

This parallel randomized trial allocated participants naive to meditation either to a meditation or exercise group. This is a two-arm randomized trial comparing the impact of meditation versus exercise over time on designated variables.

### Participants

We recruited participants from the local and online community via IRB-approved flyers and postings. Participants were informed that this was a study exploring the impact of various activities on variables such as wellness and mindfulness. They were informed that they would be asked to complete questionnaires multiple times and to participate in an ongoing manner to practice either meditation or exercise. Inclusion and exclusion criteria included that participants must read and understand English and endorse no prior significant history of meditation knowledge or practice, including yoga and other formal contemplative practices. They needed to endorse having no significant medical or mental disorder that would prevent them from safely and meaningfully participating in the study. They needed to have access to a method for viewing the video sessions and be able to commit to participating for the duration of the study, or about four months total, once their group intervention began. The intervention phase lasted eight weeks, and a follow-up questionnaire was sent electronically two months after the end of the intervention. We screened 272 and excluded 185 individuals, primarily due to the participants having previous knowledge of or currently practicing some form of meditation. Participants were recruited on a rolling basis and randomized into one of two interventions. When a group reached the maximum capacity of participants, the intervention was implemented. We enrolled 87 participants overall ( $N = 54$  in the meditation group and  $N = 33$  in the exercise group). Of these, we excluded 15 participants due to not completing required components or dropping out ( $N = 9$  meditation group and  $N = 6$  exercise group), and 72 participants ( $N = 45$  meditation group and  $N = 27$  exercise group) finished the study, including all assessments, and we proceeded to analyze their data. Overall, the study participants were predominantly non-Hispanic white females from the United States of America working full-time. Table 3 presents demographic details of the participants for both groups. Data was collected remotely using secure online data portals approved by the institution.

### Measures and Outcomes

We evaluated participants in both groups with the same set of questionnaires (minus the demographic questions) at the beginning, middle, and end of the intervention and two months after the study's conclusion. All assessments were administered online using subject identifiers rather than personally identifiable information. Additionally, group object-focused meditations were conducted with both cohorts with intention directed toward

a random number generator to analyze further the impact practicing/learning meditation has on psi abilities.

**Demographic Information.** This data includes age, race/ethnicity, gender, marital status, education, household income and employment, psychiatric history, and history of spiritual/religious/contemplative practices.

**Five-factor personality assessment (Brief Big 5).** The Brief Big 5 (Goldberg, 1992) was developed to measure personality traits or characteristics through a relatively small set of variables for shorter and easily administered markers of the Big-5 factor structure. It contains ten items and measures five personality variables: extraversion, agreeableness, openness, conscientiousness, and neuroticism. We assessed both groups throughout at all time points.

**General Wellbeing Schedule (GWBS).** This tool (GWBS; Dupuy, 1977) is a brief, reliable, validated Likert scale questionnaire that focuses on one's subjective feelings of anxiety, depression, positive well-being, self-control, general health, and vitality, with scores provided for each.

**Applied Mindfulness Process Scale (AMPS).** This a 15-item scale with Likert-type response options ranging from zero (never) to four (almost always), designed to quantify how mindfulness practitioners actively use mindfulness to remediate psychological suffering in their daily lives. Three fields that AMPS presents are: decentering, positive emotional regulation, and negative emotional regulation (Li et al., 2016).

**Five-Facet Mindfulness Questionnaire - Short Form (FFMQ - 24 items).** This is a measure of mindfulness commonly used to assess change before and after interventions. This measure is a short form of the 39-item FFMQ (Baer et al., 2006) and is based on a factor analytic study of five independently developed mindfulness questionnaires. The FFMQ-24 is a validated short form developed by Bohlmeijer et al. (2011) and includes items answered on a 5-point Likert scale. It includes the same five facets as the long form: Observing, Describing, Acting with Awareness, Non-Judging, and Non-Reactivity/Detaching.

**Social Connectedness and Social Reassurance Scale (SCS).** The scale by Lee and Robbins (1995) measures the degree of interpersonal closeness that an individual experiences in his or her social world (e.g., friends, peers, society) as well as the degree of difficulty in maintaining this sense of closeness. This self-report scale consists of eight items that are rated along a 6-point Likert-type scale.

**Adult Self-Transcendence Inventory (ASTI):** The ASTI (Levenson et al., 2005) is a self-report scale including Likert-scaled items ranging from 1 (disagree strongly)

to 4 (agree strongly). The scale consists of five dimensions: self-knowledge and integration (SI), peace of mind (PM), non-attachment (NA), self-transcendence (ST), and presence in the here-and-now and growth (PG).

**Noetic Experiences and Beliefs Scale (NEBS).** The NEBS (Wahbeh et al., 2019) is a 20-item self-report measure of paranormal beliefs, paranormal experiences, psi beliefs, and experiences. The NEBS is a concise, valid, and reliable tool for evaluating individual differences in paranormal beliefs and experiences. We assessed experiences people have either during or related to their meditation practice or spontaneously using a modified version of the survey we have used in our retrospective studies of meditators. This survey examines: (a) mystical, transcendent, or transformative experiences during or related to meditation practice, (b) social, relational, and group aspects of meditation, (c) contextual aspects of meditation practice, (d) anomalous physical phenomena related to meditation, (e) extended human capacities such as precognition, clairvoyance, or ESP, and (f) difficult states and stages of meditation practice. The survey asks respondents to report on whether any of these occurred in the course of their meditation, how frequently they occurred, and how important or meaningful they were to the respondent. These measures were used to assess the frequency and salience of these experiences.

**Psi Task - A Random Number Generator (RNG).** This was utilized as a target for group meditation to assess the difference in psi abilities between those learning/practicing meditation and those who have never been trained or practiced meditation. The random number generator used was the Araneus Alea I. The Araneus Alea I is a compact true random number generator that can also be used as a hardware random number generator and uses a USB interface. This produces a continuous stream of random numbers at 100 kilobits/second and, due to rigorous statistical testing, should not display any distinguishable patterns in their appearance or generation. The RNG utilizes a reverse-biased semiconductor junction that generates wide-band Gaussian white noise, which is then amplified and digitized using the product's analog-to-digital converter. Output bits from the converter are then further processed by an embedded microprocessor, which results in a random bit stream that is free from bias and correlation.

## Randomization

Participants were randomized to the control or intervention group by a generated random allocation sequence and allocated to either exercise or meditation group by the study coordinator, who could not predict the group

into which the participant would be randomized. Participants who were oriented to the study, met the criteria, and reviewed and signed consent were then randomized to one of the groups in a rolling enrollment. When a group of at least ten was formed, the intervention was started for that group. We enrolled and implemented interventions until our time limit was up for the study funding, and thus, the number of participants enrolled is not equal in the two conditions. We enrolled and implemented interventions until our time limit was up for the study funding, and thus, the number of participants enrolled is not equal in the two conditions.

## Procedure

This study was conducted at the University of Virginia (UVA) School of Medicine, Division of Perceptual Studies (DOPS) in Charlottesville, VA, and consisted of an 8-week trial to examine the impact of meditation or physical exercise on the variables stated above. This study was approved by the institution's IRB. Subjects were recruited from the general population and community of Charlottesville, Virginia, and the surrounding area from 2020 to 2021. Those recruited were naïve to formal meditation, yoga, and mindfulness training. After screening for eligibility and a brief study orientation, consent was obtained by a member of the research team by phone or online. Participants were then randomized to one of the two intervention cohorts and completed a baseline demographic assessment including age, ethnicity, gender, income, employment, region, marital status, religious and spiritual background, beliefs, and practices, meditation history, psychiatric history, and history of attitudes toward and beliefs about extraordinary, unusual, or transformational experiences and abilities. Participants were asked to complete additional assessments of interest at the onset of the intervention, halfway through, at the end of the intervention, and two months following completion of the study.

**Intervention.** The random allocation sequence was generated by the study team, and participants were assigned to receive the intervention. We delivered the interventions online and via an application program (accessible on smartphone, tablet, or computer) over eight weeks with nine weekly online live sessions to provide guidance and support with the materials.

The meditation intervention focused on the implementation of awareness/attention and connection with the help of an application focused on teaching and practicing such meditations. The active control intervention was a similarly interactive program with a focus on exercise and physical activity of equal duration.

We conducted the random number generator procedure to analyze the impact of practicing/learning meditation on psi abilities with all groups at the beginning, middle, and end of the study to evaluate deviations in non-random activity.

Two-thirds of the instruction and exercises for the meditation group focused on increasing awareness and connection, and the remainder of the weeks focused on insight and purpose. Meditation instruction and practice were based on practices that stem from classical meditation texts in the yoga and Buddhist schools of meditation as well as its modern secular adaptations, including Mindfulness-Based Stress Reduction (MBSR) training, subtle mind/body movement practices, and visualization exercises. Components from the "Healthy Minds" app-based well-being program that focuses on increasing awareness, connection, insight, and purpose were used for the intervention. This program of instruction was developed by the Center for Healthy Minds at the University of Wisconsin-Madison and tailored for UVA. This specialized program was provided for research participants in this study in collaboration with UVA and Healthy Minds Innovations, the external, affiliated nonprofit dedicated to supporting the mission of the Center for Healthy Minds at the University of Wisconsin. Instruction was provided online during live weekly meetings and via the app, with the participants recording practice data on their app. Topics of instruction and requested time of practice over the 8-week intervention can be found in Table 1.

The active control intervention was a similarly interactive program providing training in physical exercise of the same length and duration. The exercises were based on information from Harvard Health, the Cleveland Clinic, and the Mayo Clinic and were based on a progressive program of gentle exercises that can be modified as needed by the individual. The exercise content was comparable in time to the meditation cohort intervention. These exercises were introduced and explained during the live virtual weekly meetings, and exercises and demonstrations of such were provided online virtually. Participants tracked their practice via an app or device of their choice, such as Strava. A list of the various exercises and practice times is provided in Table 2.

All participants in both groups also participated in a group meditation with a focus on getting a true random number generator (RNG) to go "off random." These meditations happened in each group at the first live real-time session, the middle session, and the final session of the study. The dates and times of these meditations were recorded for each cohort, and the impact on the random number generator was assessed.

## Statistical Analysis

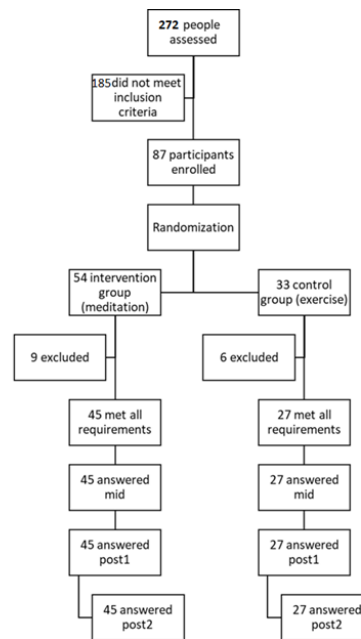
To test the study hypothesis, we conducted a series of multivariate regression models for each of the outcomes, combining mid, and follow-up measures for each score using the cohort groups as the unique independent variable. This analysis is appropriate since we have several dependent variables jointly regressed on the same independent variables. Using a joint estimator, it is possible to measure between-equation covariances, making this model more convenient for several measures across time points (Table 4). For the psi and paranormal experiences related to meditation variables (Table 5), we conducted a unique multivariate regression model with all outcomes at post 1 using the cohort groups as the sole independent variable. For the self-reported paranormal beliefs and experiences variables (Table 6), we compared both groups at follow-up using linear probability regression models with standard errors robust to heteroscedasticity. We reported  $p$ -values  $\leq 0.005$  and confidence intervals for the  $\beta$  (beta) regression coefficients as multiple tests were performed (Benjamin et al., 2018). We used *STATA 15* for all statistical analysis.

RNG data was statistically analyzed using Matlab functions that calculate the total number of bits, percent deviation, cumulated Z scores for the time interval, and max Z score. Data were analyzed for each individual cohort due to differences in meeting dates and times. Excluded participants were excluded prior to running the final analyses.

Our study flow diagram is found in Figure 1, and the results from our analyses are reported in Tables 4-6 and Figures A-C. Specifics of the differences in groups over time are summarized in Table 4 for the five-factor personality assessment (Big 5), the General Wellbeing Schedule, Applied Mindfulness Process Scale, Five-Facet Mindfulness Questionnaire - Short Form, and the Social Connectedness and Social Reassurance Scale. We were specifically interested in the changes over time in the meditation group regarding self-transcendence and noetic experiences and beliefs and thus explored those via the ASTI and NEBS with a focus on the meditation group in comparison to the exercise group in Table 5. Data regarding changes in Psi/Paranormal Lived Experiences and Perceived Significance in both groups over time are provided in Table 6.

## RESULTS

We assessed personality traits using the five-factor personality assessment (Brief Big 5). See Table 4 for details. We hypothesized that variables of agreeableness, openness, and conscientiousness, which are po-



**Figure 1.** Study Flow Diagram.

sitively associated with mindfulness, would increase in the meditation cohort versus the exercise cohort and that neuroticism would significantly decrease over time in the meditation group versus the exercise group. We found some support for our hypothesis in the differences between groups on the openness sub-scale at post-1, with the meditation group endorsing significantly more openness at the end of the intervention ( $p = 0.001$ ) and suggestive effects at Mid and post-2 interventions ( $p < 0.030$ ). Openness is a characteristic that includes imagination and insight. As a caveat, the data indicates that openness was higher at the baseline stage for the meditation group. However, effects are still suggestive with the inclusion of the baseline openness as a confounding variable ( $p = 0.009$ , results not shown in Table 4). Extroversion also significantly increased in the meditation group as assessed at post-1 also ( $p = 0.001$ ), but no other significant changes in personality variables were noted over time. Extroversion is a characteristic that includes assertiveness and high amounts of emotional expressiveness, which may have increased in the meditation group during their practice. Extroversion significantly increased over time only in the meditation group, and we may speculate that meditation allowed access to a fuller awareness and expression of emotions for these participants.

Regarding our hypothesis that participants in the meditation group would demonstrate significantly increased perceived well-being over time compared to the exercise group, this was not supported. There were no significant differences between groups on the scales of the GWBS, with both groups demonstrating significant

**Table 1.** Description of Content and Duration of Meditation Group

Week	Exercise	Minimal Daily Practice
1	Foundations of Awareness	10 min
2	Mindfulness	10 min
3	Focused Attention	10 min
4	Mindfulness of Emotion & Thought	15-20 min
5	Appreciation, Savoring & Gratitude	15-20 min
6	Extending Appreciation & Kindness	15-20 min
7	Compassion	20-30 min
8	Purpose	20-30 min

improvements over time on the anxiety and general health subscales of the GWBS at the follow-up. See Table 4 for more details. The data supports that both meditation and exercise have a positive impact on well-being over time, as it can be seen for anxiety and general health, which has previously been supported in the literature (Iwon et al., 2021). This finding may have interesting implications for designing future wellness programming since exercise alone appears to be as effective in improving wellness as meditation.

Our hypothesis that meditation group members would demonstrate significantly increased mindfulness scores on the FFMQ-24 overtime was partially supported. See Table 4 for details. We found significant increases in the meditators acting with awareness at the end of the study ( $p < 0.001$ ,  $CI$  95% -5.85; -1.90) and at the two months follow-up after the study ended ( $p < 0.001$ ,  $CI$  95% -5.88; -2.02) when compared to the participants in the exercise cohort. Additionally, at the end of the intervention, meditators endorsed suggestive changes in non-judging when compared to those at the post-follow-up two months later ( $p = 0.011$ ,  $CI$  95% -4.96; -0.68).

We further explored mindfulness as assessed by the

**Table 2.** Description of Content and Duration of Exercise Group

Week	Exercise	Minimal Daily Practice
1	Gentle Stretching Exercises	10 min
2	Introductory Balance Exercises	10 min
3	Gentle Aerobic/Cardiovascular	10 min
4	Introductory Strength Training	15-20 min
5	Moderate Stretching Exercises	15-20 min
6	Balance Exercises with Partner	15-20 min
7	Moderate Aerobic/Cardiovascular	20-30 min
8	Moderate Strength Training	20-30 min

AMPS, which is designed to quantify how mindfulness is used. See Table 4 for details. At the end of the study, we found that the exercise group endorsed significantly more use of negative emotional regulation versus the meditation group at the 2-month follow-up ( $p < 0.001$ ,  $CI$  95% 1.56; 5.07). As a caveat, the data indicates that negative emotional regulation was higher at the baseline stage for the exercise group. However, effects are still suggestive with the inclusion of the baseline variable as a confounding variable ( $p < 0.001$  at post-2, results not shown in Table 4).

We examined the hypothesis that social connectedness would increase significantly more in the meditation versus the exercise group over time and found that the overall sense of closeness and connectedness at the end of the study was not higher in the meditation group than in the exercise group. Results are just weakly suggestive (at post-1:  $p = 0.025$ ,  $CI$  95% -3.61; -0.26). We also explored self-transcendence over time and found no differences in the measures of self-transcendence on the ASTI between groups over time (see Table 4 for details).

We hypothesized that the meditation cohort would endorse significantly higher frequencies of paranormal and noetic experiences and beliefs over time than the exercise control group. See the full results in Table 5. Paranormal beliefs and experiences were assessed with the NEBS, administered at baseline and follow-up (POST 2) to both groups. We explore significant findings below. At the end of the study (Post 1), participants in the meditation cohort versus the exercise cohort reported suggestive more believing that they had an experience of seeming outside of their body so that they could see their body from a point of view outside it ( $p = 0.008$ ), having a medical condition that suddenly or unexpectedly resolved in a way that was not the result of normal medical intervention ( $p = 0.003$ ), seeing colors or energy fields around people or things ( $p = 0.032$ ), being in communication or contact with someone distant from them or without conventional means of communication ( $p = 0.039$ ), feeling like they delivered or directed healing energy to another person that had an impact on their mind or body ( $p = 0.021$ ), and having other experiences that they would consider paranormal ( $p < 0.001$ ). All results should be seen with caution as we performed multiple hypothesis tests with results above the  $p < 0.005$  threshold.

We explore the hypothesis that meditators would report significantly more paranormal and psi experiences during and throughout the study versus the exercisers at Table 6. We expected that the meditators would endorse significantly more real-time experiences of psi and paranormal activity and that these would be more important and meaningful during the study. We examined the im-



**Table 3.** Demographics for Meditation and Exercise Cohorts

Variable		Cohort group		z-test
		Meditation n (%)	Exercise n (%)	
COUNTRY	USA	43 (95.6)	25 (92.6)	
	Brazil	1 (2.2)	0 (0)	
	China	0 (0)	1 (3.7)	
	India	1 (2.2)	0 (0)	
	UK	0 (0)	1 (3.7)	
	Total	45 (100)	27 (100)	
	GENDER	Female	35 (77.8)	22 (81.5)
	Male	9 (20)	5 (18.5)	
	Other	1 (2.2)	0 (0)	
	Total	45 (100)	27 (100)	
MARITAL STATUS	Cohabiting	2 (4.4)	2 (7.4)	
	Divorced	1 (2.2)	3 (11.1)	
	Married	16 (35.6)	14 (51.9)	
	Separated	2 (4.4)	0 (0)	
	Single	23 (51.1)	8 (29.6)	
	Widow(er)	1 (2.2)	0 (0)	
	Total	45 (100)	27 (100)	
	ETHNICITY	American Indian or Alaskan Native	0 (0)	1 (3.7)
	Asian American or Pacific Islander	4 (8.9)	2 (7.4)	
	Black or African American	1 (2.2)	0 (0)	
	Hispanic - Cuban	0 (0)	1 (3.7)	
	Hispanic - Other	1 (2.2)	0 (0)	
	Mixed Race	3 (6.7)	0 (0)	
	Non-Hispanic white	34 (75.6)	21 (77.8)	
	Non-Hispanic white	0 (0)	1 (3.7)	
	Other	2 (4.4)	1 (3.7)	
	Total	45 (100)	27 (100)	
EDUCATION	Bachelor's degree	12 (26.7)	7 (25.9)	
	Doctoral degree or Professional degree (MD, JD, etc.)	3 (6.7)	0 (0)	
	High school or equivalent	4 (8.9)	0 (0)	
	High School or equivalent	0 (0)	2 (7.4)	
	Less than high school	0 (0)	9 (33.3)	
	Master's degree	18 (40)*	1 (3.7)*	p<0.001
	Some college/technical school (2 years)	0 (0)	7 (25.9)	
	Some college/technical school (High School Equivalent)	4 (8.9)	0 (0)	
	Some graduate school	4 (8.9)	1 (3.7)	
	Total	45 (100)	27 (100)	

EMPLOYMENT	Full-time	28 (62.2)	16 (59.3)
	Full-time College/University Student	8 (17.8)	2 (7.4)
Other	1 (2.2)	1 (3.7)	
Part-time	3 (6.7)	4 (14.8)	
Retired	1 (2.2)	1 (3.7)	
Self-employed	1 (2.2)	3 (11.1)	
Unemployed	3 (6.7)	0 (0)	
Total	45 (100)	27 (100)	
Household Income	\$100K to under \$150K	7 (15.6)	6 (22.2)
	\$150K to under \$250K	6 (13.3)	6 (22.2)
	\$250K or greater	1 (2.2)	1 (3.7)
	\$30K to under \$75K	16 (35.6)	9 (33.3)
	\$75K to under \$100K	5 (11.1)	3 (11.1)
	Decline to answer	3 (6.7)	0 (0)
	Under \$30K	7 (15.6)	2 (7.4)
	Total	45 (100)	27 (100)

pact of the intervention via a survey to assess the frequency and salience of these experiences.

Exploring differences between the groups at the immediate end of the study (Post 1), we see that data supports that meditators endorsed having significant results compared to exercisers in reporting: an altered sense of hearing and hearing things that were not in the physical environment ( $p < 0.001$ ); having an altered sense of taste in tasting things that were not physically present ( $p < 0.001$ ); having an altered sense of space such as feeling distortions in space around them ( $p < 0.001$ ); having an altered sense of identity ( $p < 0.001$ ); experiencing disturbing feelings or fear ( $p < 0.001$ ); having a sense of collective energy from the group they were with ( $p < 0.001$ ); being aware of a non-physical entity, such as a God presence higher powers, divine beings or other visitors ( $p < 0.001$ ); experiencing things moving, objects appearing with no physical cause ( $p < 0.001$ ); and experiencing clairvoyance or telepathy ( $p < 0.001$ ). The exercise cohort endorsed experiencing altered breathing significantly more than the meditation cohort ( $p = 0.003$ ). We did not collect data on this variable at Post 2, and thus are not certain if these differences persisted over time. Future research may wish to extend follow-up periods to examine this.

We also explored the impact of both groups' meditations upon a random number generator to explore the impact on the randomness of the numbers generated as an indicator of psi abilities. We hypothesized that the meditation cohort would show more significant deviations from



**Table 4.** Comparison of Big 5, GWBS, FFMQ, AMPS, SCSA Between Groups over Time

Variable	Meditation	Exercise	p
Time: Name	Mean (SD)	Mean (SD)	
<b>Five-factor personality assessment (Big Five)</b>			
<b>Pre: Extroversion</b>	6.77(1.72)	6.33(2.02)	
Mid: Extroversion	6.77(1.72)	5.86(2.06)	0.053
Post 1: Extroversion	7(1.67)	5.55(1.63)	0.001*
Post 2: Extroversion	6.43(1.85)	5.39(1.58)	0.112
<b>Pre: Agreeableness</b>	6.84(1.76)	6.78(1.72)	
Mid: Agreeableness	7.14(1.82)	7(1.9)	0.595
Post 1: Agreeableness	6.86(1.92)	6.73(1.8)	0.156
Post 2: Agreeableness	7.03(1.99)	6.83(1.98)	0.792
<b>Pre: Conscientiousness</b>	7.82(2.11)	7.37(2.1)	
Mid: Conscientiousness	8.11(2.01)	8.29(1.98)	0.751
Post 1: Conscientiousness	7.86(1.97)	8(1.88)	0.633
Post 2: Conscientiousness	8.13(2.15)	7.67(2.03)	0.267
<b>Pre: Neuroticism</b>	6.53(2.31)	6.22(2.33)	
Mid: Neuroticism	5.8(2.29)	5.76(1.95)	0.947
Post 1: Neuroticism	5.61(2.27)	5.82(1.99)	0.384
Post 2: Neuroticism	5.6(1.83)	6.17(2.07)	0.225
<b>Pre: Openness</b>	7.51(1.88)	6.81(1.84)	
Mid: Openness	7.71(1.96)	6.52(1.47)	0.023
Post 1: Openness	7.84(1.85)	6.14(1.39)	0.001*
Post 2: Openness	7.6(2.04)	6.28(1.49)	0.025
<b>The General Wellbeing Schedule</b>			
<b>Pre: GWBS Anxiety</b>	14.96(5.01)	13.48(4.48)	
Mid: GWBS Anxiety	12.09(3.31)	11.76(4.86)	0.877
Post 1: GWBS Anxiety	11.68(3.39)	11.59(4.55)	0.525
Post 2: GWBS Anxiety	12.33(3.99)	12.28(4.66)	0.693
<b>Pre: GWBS Depression</b>	9.89(1.23)	8.07(1.38)	
Mid: GWBS Depression	10.51(1.31)	10.71(1.62)	0.534
Post 1: GWBS Depression	10.36(1.48)	10.59(1.68)	0.517
Post 2: GWBS Depression	10.5(1.46)	10.72(1.93)	0.352
<b>Pre: GWBS Positive Wellbeing</b>	14.6(2.82)	13.93(2.63)	
Mid: GWBS Positive Wellbeing	13.09(1.74)	12.71(1.95)	0.670
Post 1: GWBS Positive Wellbeing	12.5(2.42)	12.82(2.42)	0.415
Post 2: GWBS Positive Wellbeing	12.53(2.03)	13.17(2.92)	0.781
<b>Pre: GWBS Self Control</b>	8.31(1.5)	9.22(1.87)	
Mid: GWBS Self Control	8.46(1.34)	8.81(1.36)	0.924
Post 1: GWBS Self Control	8.41(1.15)	9(1.6)	0.111
Post 2: GWBS Self Control	8.77(1.3)	8.78(1.17)	0.747
<b>Pre: GWBS General Health</b>	10.07(1.66)	10.96(1.37)	
Mid: GWBS General Health	10.66(1.51)	11.43(1.66)	0.113
Post 1: GWBS General Health	10.84(1.35)	11.82(1.37)	0.034
Post 2: GWBS General Health	10.8(1.49)	11.39(1.38)	0.198
<b>Pre: GWBS Vitality</b>	14.98(2.8)	14.22(2.31)	
Mid: GWBS Vitality	13.49(2.15)	13(2.28)	0.842
Post 1: GWBS Vitality	13.16(2.31)	12.18(2.79)	0.504
Post 2: GWBS Vitality	12.9(2.09)	11.56(2.62)	0.139
<b>Applied Mindfulness Process Scale</b>			
<b>Pre: FFMQ Observing</b>	13.89(3.36)	13.7(3.23)	
Mid: FFMQ Observing	15.09(2.9)	15.38(2.48)	0.769
Post 1: FFMQ Observing	15.48(2.72)	15.64(3.19)	0.819
Post 2: FFMQ Observing	15.17(3.11)	16.28(3.14)	0.389
<b>Pre: FFMQ Detached</b>	13.76(3.54)	16(2.96)	
Mid: FFMQ Detached	15.71(2.94)	16.62(3.71)	0.551
Post 1: FFMQ Detached	16.45(2.94)	17.59(3.33)	0.518
Post 2: FFMQ Detached	16.73(3.27)	18.39(3.29)	0.171
<b>Pre: FFMQ Awareness</b>	14.98(3.41)	15.59(3.7)	
Mid: FFMQ Awareness	16.54(3.13)	15.24(4.1)	0.015
Post 1: FFMQ Awareness	16.91(3.37)	14.95(4.1)	<0.001*
Post 2: FFMQ Awareness	17.53(2.89)	13.67(3.29)	<0.001*
<b>Pre: FFMQ Non-Judging</b>	15.33(4.17)	15.89(4.46)	
Mid: FFMQ Non-Judging	16.91(3.36)	15.38(4.28)	0.112
Post 1: FFMQ Non-Judging	17.27(3.33)	15.91(4.31)	0.038
Post 2: FFMQ Non-Judging	18.03(2.66)	15.33(4.26)	0.011

<b>Five-Facet Mindfulness Questionnaire - Short Form</b>			
<b>Pre: AMPS Decentering</b>	10.98(3.25)	12.07(2.29)	
Mid: AMPS Decentering	12.43(2.84)	12.1(2.28)	0.275
Post 1: AMPS Decentering	13.14(2.82)	12.73(2.29)	0.120
Post 2: AMPS Decentering	13.77(2.82)	13.11(2.59)	0.277
<b>Pre: AMPS Positive Emotional Regulation</b>	13.91(3.7)	13.59(3.25)	
Mid: AMPS Positive Emotional Regulation	14.8(3.02)	13.95(3.99)	0.110
Post 1: AMPS Positive Emotional Regulation	15.59(3.08)	14.59(3.81)	0.048
Post 2: AMPS Positive Emotional Regulation	15.37(3.47)	14.44(3.78)	0.190
<b>Pre: AMPS Negative Emotional Regulation</b>	8.69(3.26)	9.85(4.5)	
Mid: AMPS Negative Emotional Regulation	11.69(2.96)	13.05(4.12)	0.504
Post 1: AMPS Negative Emotional Regulation	10.32(2.66)	13.5(3.49)	0.005*
Post 2: AMPS Negative Emotional Regulation	10.3(2.28)	13.78(3.41)	<0.001*
<b>Pre: AMPS Total Score</b>	35.62(9.77)	38.33(8.19)	
Mid: AMPS Total Score	38.91(7.69)	39.1(9.49)	0.499
<b>The Social Connectedness and Social Reassurance Scale3</b>			
<b>Pre: SCSA Social Connectedness</b>	19.11(2.94)	17.74(3.14)	
Mid: SCSA Social Connectedness	19.74(2.5)	19(2.77)	0.089
Post 1: SCSA Social Connectedness	19.55(2.87)	18.82(3.11)	0.025
Post 2: SCSA Social Connectedness	19.67(2.48)	18.67(3.05)	0.104
<b>The ASTI transcendence</b>			
<b>Pre: ASTI Transcendence</b>	115.78(20.76)	125.37(18.35)	
Mid: ASTI Transcendence	125.74(17.9)	129.38(15.35)	0.868
Post 1: ASTI Transcendence	129.3(17.13)	129.05(17.2)	0.430
Post 2: ASTI Transcendence	128.03(17.11)	128.28(18.55)	0.719

non-significant result of  $Z = 0.0004$   $p = 0.5002$ . The results from the exercise cohort, 3 meditation sessions for 18 minutes, and 1303 trials yielded a non-significant result of  $Z = 0.0001$   $p = 0.5000$ . The deviation plots below show lines at  $p = 0.05$ ; the jagged lines show the cumulative deviations from all trials. None of the results were significant in showing deviations from randomness.

**DISCUSSION**

Overall, results indicate that both groups improved significantly in well-being scores, such as anxiety and general health. Perhaps this is due to the widely accepted positive effects of both exercise and meditation. Although this may not be a surprising finding, it is a helpful finding in that it supports exercise groups as an effective active control. The meditation group endorsed significantly higher scores on the personality variables of openness and extroversion over time. The increased extroversion variable was unexpected and deserves further exploration. The meditation cohort also endorsed experiencing all of the paranormal events on the scale at significant levels over time, with about half of these experiences being endorsed as important or meaningful to them. The psi experiment to explore actual abilities did not produce significant results.

Our overarching research question was whether participants naïve to meditation who learn and engage in meditation versus exercise would report significant changes in several variables, including increased mindfulness, social connectedness, and specific paranormal and psi experiences by self-report and in a psi task of impacting a random number generator (RNG). These questions are rooted in the theory that subjective experiences of mind-

randomness vs. the exercise cohort, even with the knowledge that neither group was experienced in meditation practices. As expected, the RNG did not show any deviations in randomness during any of the pre-test baselines at the  $p = 0.05$ . The RNG also did not show any residual deviations during any of the post-test data acquisitions at the  $p = 0.05$ . The results of the first meditation cohort, three meditation sessions for 26 minutes and 1796 trials, yielded a non-significant result of  $Z = -0.0013$   $p = 0.4995$ . The results from the second meditation cohort, 3 meditation sessions for 22 minutes and 1415 trials, yielded a



**Table 5.** Noetic Experiences and Beliefs Scale Individual Item Results Comparing Meditation and Exercise Cohorts at Post 1

Variable Time: Name	Meditation	Exercise	p
	Mean (SD)	Mean (SD)	
Intuition	2.76(1.77)	3.52(1.85)	0.086
After Death Communication	2.38(1.66)	2.59(1.82)	0.610
Out of Body	1.69(1.08)	2.7(2.09)	0.008
Healing	1.24(0.71)	2.15(1.75)	0.003
Past Life	1.73(1.23)	2.26(1.75)	0.139
Universal Force	3.18(1.67)	3.26(1.68)	0.842
Energy Field	1.64(1.25)	2.44(1.85)	0.032
Communicate	1.87(1.46)	2.7(1.9)	0.039
Dream	3.4(1.4)	2.78(1.78)	0.105
Knowing	2.44(1.74)	2.41(1.69)	0.930
Receive Healing	2.73(1.79)	2.89(1.91)	0.729
Give Healing	2.38(1.59)	1.52(1.31)	0.021
Premonition	2.64(1.65)	3.15(1.92)	0.243
Other Paranormal	0.18(0.39)	1.78(0.42)	0.000

fulness, oneness, interconnectedness, timelessness, and dissolution of ordinary limits of perception might have some basis in reality and lead to increases in abilities and experiences such as intuition and extrasensory perception. To examine these questions, our research examined 45 participants learning and practicing meditation, and 27 participants engaged in an active control exercise group. The study participants were predominantly non-Hispanic white females from the United States of America and working full-time; thus, future research would benefit from examining a more diverse population in order to expand the generalizability of findings.

Many of the psychosocial measures were significantly improved during the study, both within the meditation cohort and when compared to the exercise group. This is not a surprise, given the robust body of evidence linking meditation practice with an array of positive psychosocial outcomes. In addition, the cohort engaging in meditation demonstrated suggestive increased mindfulness scores over time. Both the meditation and exercise groups endorsed improvements in aspects of general well-being. This is also not surprising given the literature that supports the positive impact of both meditation and exercise on well-being. Although self-transcendence did not differ across time between groups, measures of social connectedness increased more suggestively in the meditation group than the exercise group, with the ove-

**Table 6.** Psi/Paranormal Lived Experiences and Perceived Significance in Meditation versus Exercise Group at End of Intervention (Post 1)

Variable Time: Name	Meditation	Exercise	p
	Mean (SD)	Mean (SD)	
Body Sensations	0.68(0.47)	0.59(0.5)	0.481
Importance/Meaning	56.43(33.47)	31.14(29.41)	0.002
Visions	0.5(0.51)	0.73(0.46)	0.070
Importance or Meaningfulness	38.98(33.6)	20.36(26.65)	0.017
Somatic changes	0.55(0.5)	0.68(0.48)	0.285
Importance or Meaningfulness	43.34(37.57)	19.41(28.72)	0.005
Hearing Things	0.14(0.35)	0.95(0.21)	0.000
Importance or Meaningfulness	25.7(29.2)	11.91(21.18)	0.032
Tasting things	0.05(0.21)	0.82(0.39)	0.000
Importance or Meaningfulness	22.11(25.74)	17(23.46)	0.421
Breathing changes	0.75(0.44)	0.36(0.49)	0.003
Importance or Meaningfulness	53.75(33.34)	49.73(31.32)	0.631
Sense of time changes	0.73(0.45)	0.73(0.46)	1.000
Importance or Meaningfulness	49.84(32.03)	27.09(32.12)	0.008
Sense of space changes	0.39(0.49)	0.82(0.39)	0.000
Importance or Meaningfulness	36.61(32.67)	20.5(28.61)	0.043
Synchronicities	0.36(0.49)	0.64(0.49)	0.036
Importance or Meaningfulness	39.93(35.87)	32.23(30.84)	0.367
Creativity	0.59(0.5)	0.64(0.49)	0.725
Importance or Meaningfulness	57.36(37.6)	35.27(34.58)	0.020
Identity	0.3(0.46)	0.77(0.43)	0.000
Importance or Meaningfulness	37.45(37.24)	23.95(33.28)	0.139
Fearful	0.18(0.39)	0.91(0.29)	0.000
Importance or Meaningfulness	27.66(29.03)	19.77(31.42)	0.326
Collective Energy	0.32(0.47)	0.77(0.43)	0.000
Importance or Meaningfulness	35.57(36.12)	21.14(29.54)	0.087
Distant Energy	0.48(0.51)	0.64(0.49)	0.223
Importance or Meaningfulness	0.45(0.5)	0.64(0.49)	0.164
Connection	43.89(36.2)	31.32(31.1)	0.147
Importance or Meaningfulness	49.86(35.56)	30.09(32.5)	0.027
God like presence	0.18(0.39)	0.77(0.43)	0.000
Importance or Meaningfulness	33.43(32.4)	24.23(31.12)	0.266
Moving things	0.09(0.29)	0.86(0.35)	0.000
Importance or Meaningfulness	22.55(26.32)	17.95(27.34)	0.516
Telepathy	0.07(0.25)	0.91(0.29)	0.000
Importance or Meaningfulness	24.05(28.87)	17.14(28.6)	0.358





rall sense of closeness and connectedness present in the meditation group during the study and at the end of the study. The meditation group reported more psi and paranormal experiences than the comparison group, and these persisted over time into the two-month follow-up after the end of the study. Furthermore, the meditation cohort endorsed at least some of the experiences that were significantly important or meaningful to them. Reported that these experiences were more important or meaningful to them than they were to the comparison group.

None of the results were significant in showing deviations from randomness on the RNG.

### Limitations

There are several limitations to this study that need to be acknowledged and discussed. One potential limitation is the sample size. The study may lack statistical power to detect small but meaningful effects. This is especially important given the large number of outcomes examined. The lack of power could result in false negatives, meaning that the study may have failed to detect the true effect because of insufficient sample size. Additionally, we used a more demanding threshold to detect significance due to the numerous hypothesis tests done, as Benjamin et al. (2018) suggested, which further reduces the statistical power of the tests.

Another limitation of this study is the relatively short duration of the intervention. The study involved an 8-week intervention period, and although this period of time is fairly standard in the field, it may not have been long enough for participants to experience significant changes in outcomes. Meditation, in particular, is known to be a practice that requires a significant amount of time to produce noticeable changes in individuals. Therefore, the results of the study may not be generalizable to longer interventions or to individuals who practice meditation or exercise for a longer duration.

Furthermore, the study did not account for potential confounding variables such as the experience of the participants in the meditation and exercise groups. While we tried to control for past and current experience, participants in the exercise groups could have begun meditating on their own during the study, although they were explicitly directed not to do so. In conclusion, while the study provides valuable insights into the effects of meditation and exercise on various psychological outcomes, it is important to consider its limitations. The sample size and the short duration of the intervention may limit the generalizability of the study's findings. Future studies could address these limitations by using larger sample sizes, longer intervention periods, and controlling for potential

confounding variables.

### Implications and Applications

We conclude that this study provides enough evidence to warrant additional research exploring the impact of meditation on paranormal or psi abilities. We recommend increased sample sizes to increase power and additional studies that utilize a controlled design with perhaps more intense or lengthy practice. Additionally, exploring the abilities of advanced meditators and their psi abilities would be an ideal next step. Based on this preliminary data, we intend to further our research by examining such individuals and exploring their abilities and experiences in more detail. We also wish to explore the endorsed impact of such experiences or abilities upon the individuals experiencing them. Exploring the significance of these experiences on the beliefs and well-being of those who experience them is also important to expand our full understanding of the impact on individuals and in larger communities.

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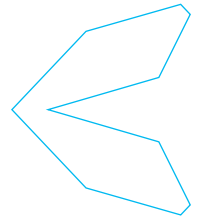
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### REFERENCES

- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27-45. <https://doi.org/10.1177/1073191105283504>
- Benjamin, D. J., Berger, J. O., Johannesson, M., Nosek, B. A., Wagenmakers, et al. (2018). Redefine statistical significance. *Nature Human Behaviour*, 2(1), 6-10. <https://doi.org/10.1038/s41562-017-0189-z>
- Boccia, M., Piccardi, L., & Guariglia, P. (2015). The meditative mind: A comprehensive meta-analysis of MRI studies. *BioMed Research International*, 2015, Article 419808. <https://doi.org/10.1155/2015/419808>

- Bohlmeijer, E., ten Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. (2011). Psychometric properties of the five facet mindfulness questionnaire in depressed adults and development of a short form. *Assessment, 18*(3), 308–320. <https://doi.org/10.1177/1073191111408231>
- Braud, W. G. (2008). Patanjali yoga and siddhis: Their relevance to parapsychological theory and research. In K. R. Rao, M. Cornelissen, & J. Dalal (Eds.), *Handbook of Indian psychology* (pp. 217–243). Foundations Books.
- Chiesa, A. (2010). Vipassana meditation: Systematic review of current evidence. *Journal of Alternative and Complementary Medicine, 16*(1), 37–46. <https://doi.org/10.1089/acm.2009.0362>
- Chiesa, A., Brambilla, P., & Serretti, A. (2011). Neuro-imaging of mindfulness meditations: Implications for clinical practice. *Epidemiology Psychiatric Sciences, 20*(2), 205–210. <https://doi.org/10.1017/S204579601100028X>
- Dupuy, H. J. (1977). The general well-being schedule. In I. McDowell & C. Newell (Eds.), *Measuring health: A guide to rating scales and questionnaire* (2nd ed) (pp. 206–213). Oxford University Press.
- Fox, K. C., Nijeboer, S., Dixon, M. L., Floman, J. L., Ellamil, M., et al. (2014). Is meditation associated with altered brain structure? A systematic review and meta-analysis of morphometric neuroimaging in meditation practitioners. *Neuroscience and Biobehavioral Reviews, 43*, 48–73. <https://doi.org/10.1016/j.neubiorev.2014.03.016>
- Fox, K. C., Dixon, M. L., Nijeboer, S., Girn, M., Floman, J. L., Lifshitz, M., et al. (2016). Functional neuroanatomy of meditation: A review and meta-analysis of 78 functional neuroimaging investigations. *Neuroscience and Biobehavioral Reviews, 65*, 208–228. <https://doi.org/10.1016/j.neubiorev.2016.03.021>
- Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment, 4*(1), 26–42. <https://doi.org/10.1037/1040-3590.4.1.26>
- Goyal, M., Singh, S., Sibinga, E. M., Gould, N. F., Rowland-Seymour, A., et al. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine, 180*(9), 1809–1816. <https://doi.org/10.1001/jamainternmed.2013.13018> [pii].
- Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., et al. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research, 191*(1), 36–43. <https://doi.org/10.1016/j.psychres.2010.08.006>
- Iwon, K., Skibinska, J., Jasielska, D., & Kalwarczyk, S. (2021). Elevating subjective well-being through physical exercises: An intervention study. *Frontiers in Psychology, 12*, Article 702678. <https://doi.org/10.3389/fpsyg.2021.702678>
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., et al. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review, 33*(6), 763–771. doi: 10.1016/j.cpr.2013.05.005 S0272-7358(13)00073-1 [pii].
- Lama, D. (2005). *In the Buddha's words: An anthology of discourses from the Pali Canon*. Simon and Schuster.
- Lee, R. M., & Robbins, S. B. (1995). Measuring belongingness: The Social Connectedness and the Social Assurance scales. *Journal of Counseling Psychology, 42*(2), 232–241. <https://doi.org/10.1037/0022-0167.42.2.232>
- Levenson, M. R., Jennings, P. A., Aldwin, C. M., & Shiraiishi, R. W. (2005). Self-transcendence: Conceptualization and measurement. *International Journal of Aging and Human Development, 60*(2), 127–143. <https://doi.org/10.1037/0022-0167.42.2.232>
- Li, M. J., Black, D. S., & Garland, E. L. (2016). The Applied Mindfulness Process Scale (AMPS): A process measure for evaluating mindfulness-based interventions. *Personality and Individual Differences, 93*, 6–15. <https://doi.org/10.1016/j.paid.2015.10.027>
- Nelson, R. D. (1997). Multiple field REG/RNG recordings during global events. *Electronic Journal for Anomalous Phenomena (eJAP)*. Available at: <http://www.psy.uva.nl/eJAP>.
- Nelson, R. D. (2002). Coherent consciousness and reduced randomness: Correlations on September 11, 2001. *Journal of Scientific Exploration, 16*(4), 549–570.
- Penberthy, J. P., Hodge, A. S., Hook, J. N., Delorme, A., Pehlivanova, M., & Vieten, C. (2020). Meditators and nonmeditators: A descriptive analysis over time with a focus on unusual and extraordinary experiences. *Journal of Yoga and Physiotherapy, 8*(3), Article 555744. <https://doi.org/10.19080/JYP.2020.08.555744>
- Radin, D. (2013). *Supernormal: Science, yoga, and the evidence for psychic abilities*. Deepak Chopra Books.
- Radin, D. I., & Patterson, R. (2007). Exploratory study: The random number generator and group meditation. *Journal of Scientific Exploration, 21*(2), 295–317.
- Radin, D. I., Vieten, C., Michel, L., & Delorme, A. (2011). Electro-cortical activity prior to unpredictable stimuli in meditators and nonmeditators. *Explore, 7*(5), 286–299. <https://doi.org/10.1016/j.explore.2011.06.004>
- Radin, D., Michel, L., Galdamez, K., Wendland, P., Rickenbach, R., & Delorme, A. (2012). Consciousness and the double-slit interference pattern: Six experiments. *Physics Essays, 25*(2), 157. <https://doi.org/10.1016/j.pse.2012.03.004>

- org/10.4006/0836-1398-25.2.157
- Roney-Dougal, S. M., & Solfvin, J. (2011). Exploring the Relationship between Tibetan Meditation Attainment and Precognition. *Journal of Scientific Exploration*, 25(1), 29–46
- Roney-Dougal, S. M., Solfvin, J., & Fox, J. (2008). An exploration of degree of meditation attainment in relation to psychic awareness with Tibetan Buddhists. *Journal of Scientific Exploration*, 22(2), 161-78.
- Satyananda Saraswati, Sw. (1976/2000). *Four chapters on freedom*. Yoga Publications Trust.
- Singh, D., Raj, A., & Tripathi, J. S. (2019). The benefits of mindfulness in improving mental health and well-being. *IAHRW International Journal of Social Sciences Review*, 7(3), 427-430.
- Vieten C., & Astin J. (2008). Effects of a mindfulness-based intervention during pregnancy on prenatal stress and mood: Results of a pilot study. *Archives of Women's Mental Health*, 11(1), 67-74. <https://doi.org/10.1007/s00737-008-0214-3>
- Vieten C., Astin J., Buscemi R., Galloway G. (2010). Development of an acceptance-based coping intervention for alcohol dependence relapse prevention. *Substance Abuse*, 31(2), 108-116. <https://doi.org/10.1080/08897071003641594>
- Vieten, C., Wahbeh, H., Cahn, B. R., MacLean, K., Estrada, M., et al. (2018). Future directions in meditation research: Recommendations for expanding the field of contemplative science. *PLoS One*, 13(11), Article e0205740. <https://doi.org/10.1371/journal.pone.0205740>.
- Wahbeh, H., Yount, G., Vieten, C., Radin, D., & Delorme, A. (2019). Measuring extraordinary experiences and beliefs: A validation and reliability study. *F1000Research*, 8, Article 1741. <https://doi.org/10.12688/f1000research.20409.1>
- Walleczek, J., & von Stillfried, N. (2019). False-positive effect in the Radin double-slit experiment on observer consciousness as determined with the advanced meta-experimental protocol. *Frontiers in Psychology*, 10(1891), Article 1891. <https://doi.org/10.3389/fpsyg.2019.01891>
- Williams, B. J. (2021). Minding the matter of psychokinesis: A review of proof-and process-oriented experimental findings related to mental influence on random number generators. *Journal of Scientific Exploration*, 35(4), 829-932. <https://doi.org/10.31275/20212359>



RESEARCH  
ARTICLE

# The Pharaoh's Curse: New Evidence of Unusual Deaths Associated With Ancient Egyptian Tombs

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## HIGHLIGHTS

The Pharaoh's Curse written on some Egyptian tombs might have warned against mysterious deaths that actually trace to radiation poisoning.

## ABSTRACT

A survey of modern-era field Egyptologists reveals a very high incidence of unusual deaths consistent with symptoms of haematopoietic cancer, a scenario that parallels radiation sickness caused by exposure to abnormally high radiation previously reported in ancient tombs. However, the high radiation in tombs is not explained by the 'natural' background, which is rare in limestone bedrock. Here, re-examination of Egyptian funerary literature reveals reference to saffron cake in portions of 2-3-5 (yellowcake U-235), giving power by means of an invisible 'efflux', and leaving a legacy of hazardous 'excrements' (wastes) which were buried in an underground 'tomb' called the *per D'jet* (house of millions of years). The ancient curse warned that those who break this tomb shall meet death by a disease that no doctor can diagnose.

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## KEYWORDS

Ancient Egyptian tombs, cancer, mastaba, Pharaoh's Curse, radiation sickness, Tut's tomb, unusual deaths, yellowcake.

## INTRODUCTION

Both contemporary and ancient Egypt populations are characterised by unusually high incidence of haematopoietic cancers, of bone/blood/lymph, for which a primary known cause is radiation exposure. In recent years, the popular mythology of the Pharaoh's Curse has been associated solely with the discovery of Tutankhamun's tomb in 1922, following which the exploration sponsor, Lord Carnarvon, died unusually within a few weeks. But the history of the curse is very much older, going back to the early Old Kingdom from ca. 3000 BCE. In ancient Egypt, the 'tomb' itself was called the *pr D'jt* (*per D'jet*), meaning the 'house of eternity' (literally 'millions of

years'), and was characterised in religious terms as sacred or sacrosanct (unapproachable). That ancient knowledge passed into modern Arabic folklore, where early European archaeologists recorded that the ruins were still called *Haram el-Mastabat* (forbidden, prohibited mastaba), and local guides refused to approach because of fear of *illahat* (evil spirits). (Budge, 1904, pp. 14-15)

The nature of the curse was explicitly inscribed on some tombs, with one translated presciently as, "they that break this tomb shall meet death by a disease that no doctor can diagnose" (Hawass, 2000, pp. 94-97). The age-old curse was recognised by modern-era archaeologists. British Egyptologist Arthur Weigall, a rival of Howard Car-



ter in excavations around Thebes, watched an exultant Carnarvon (with Carter) enter Tut's tomb and remarked to a colleague, "he will be dead within six weeks." (Nelson, 2002, pp. 1482-1484). Ironically, Carnarvon was dead within a few weeks of the uncertain diagnosis of blood poisoning and pneumonia, while Weigall died prematurely at 54 of cancer, and Carter died later at 65 of Hodgkin's lymphoma.

Despite the long known history of 'the curse,' it was not taken seriously by early Egyptologists. At the height of the romance of Egyptomania, the popular press made extravagant claims for the malevolent spirits of Tut's tomb, but orthodox Egyptologists were scornful. Carter scoffed, "all sane people should dismiss such inventions with contempt." (Nelson, 2002, pp. 1482-1484). Nevertheless, he was fearful enough to take swabs of the sarcophagus and samples of air, but all were sterile. Despite his scorn, Carter was careful to run tests within the limits of the knowledge and technology available in 1922.

Now, recent studies have revealed that the ancient tombs are strongly radioactive, and here it is shown that Egyptologists who explored the tombs have suffered a high incidence of haematopoietic cancer and related symptoms of what is recognised as radiation sickness. Including Carter, who died of Hodgkin's lymphoma.

### Summary of an Unorthodox Hypothesis

This study presents a sequence of related observations that lead to an unorthodox conclusion:

- Ancient Egypt exhibited an unusual incidence of cancer and of undefined 'poisoning', attributed (in translation) to famine, plague, or evil spirits.
- Modern studies confirm very high levels of radiation in ancient Egyptian tombs, in the order of 10x accepted safety standards.
- Here, a survey of field Egyptologists who worked in the tombs reveals a very high incidence of cancer, cardiovascular failure, and other sudden/unusual deaths with symptoms characteristic of radiation sickness.
- Reported strong radiation (as radon) in tomb ruins has been loosely attributed to the natural background from the parent bedrock. However, the levels are unusually high and localised, which is not consistent with the characteristics of the limestone bedrock but implies some other unnatural source(s).
- Examination of Egyptian funerary literature reveals explicit reference to the transformation of Osiris by the efflux of yellowcake-235 ( $U_{235}$ ) and the burial of the hazardous excrements (wastes).
- Textual and archaeological evidence of the tombs pres-

ents a wide range of features that correspond closely in detail to modern principles of underground storage of long-life radioactive nuclear waste. The burial vaults were called *per D'jet*, meaning secure underground house of millions of years, described as sacred or sacrosanct (unapproachable); which passed into modern Arabic as *Haram el-Mastabat*, forbidden, prohibited mastaba because of *illahat* (evil spirits).

These observations present evidence that, at a stage in ancient Egyptian history ca 3000-2500 BCE, there were vaults [bunkers] with features and residual effects (of radioactivity) indicating deliberate, organised burial of long-life nuclear wastes. No commentary is offered on the who, how, and why questions relating to the implied technology, which is outside the scope of this paper.

This hypothesis is quite unorthodox and contrary to perceived views of ancient Egyptian history, but it is sufficiently supported to warrant further direct investigation.

### Cancer In Contemporary Egypt

The general population of modern Egypt exhibits high rates of cancer. A 1999-2005 study in the Delta showed the incidence of haematopoietic cancers [HC] was much higher than in adjacent comparable countries (Herzog et al, 2012, pp. 2748-2755). A wider national study for 2008-2011 indicated the total rate for all cancers is higher than expected, intermediate between more and less developed countries, within which HCs were ranked at #5, which is much higher than the world average (Ibrahim et al, 2014, pp. 437-971). The high incidence of HC in present-day Egypt has been loosely blamed on modern lifestyle factors such as diet and industrial pollutants. But that view has been firmly rebutted by evidence from ancient Egypt (Faltas, 2011, p. 76). The primary known cause of haematopoietic cancers is radiation exposure, and some Egyptian dwellings are known to exhibit high levels of radon, ranging up to 220 Bq/m<sup>3</sup>, which is above the maximum levels recommended by ICRP, USEPA, and WHO (Arafat et al., 2018, pp. 147-156).

### Cancer In Ancient Egypt

Several modern forensic studies confirm an unexpectedly high incidence of haematopoietic cancers (HC) in ancient Egypt (Binder et al, 2014; Faltas, 2011; Lovell & Whyte, 1999; Mant, 2014; Pahl, 1986; University of Grenada, 2017; Zink, 1999). Studies of skeletons from various sites and periods have revealed examples of multiple osteolytic lesions of myeloma, degenerative joint disease, cranial porosity, and nasopharyngeal carcinoma at rates

much higher than in modern populations. Faltas (2011, p. 76) pointed out that this data firmly refutes popular claims that HC is solely a modern disease. Some authors assert that the incidence of bone porosity *must have been* due to famine, but Egyptian texts (below) make it clear that the 'plague' was not caused by a famine but described as the burning power of magic spells released by senseless people. Incidence of internal blood or digestive system ailments was recognised in ancient medical texts, which featured remedies for casting out evils of the blood and for treating 'corruption' (Egyptian: *whwd*) characterised by weakness of the flesh, wasting away, diarrhoea, passing blood and putrefaction - attributed to malevolence of evil spirits (Ritner, 2000, pp. 107-117; Unger, 2020, pp. 123-138). The high incidence of (fatal) HC is also consistent with the records of hundreds of 'retainers' (workers) at Abydos who appeared to be sacrificed by poisoning (Recht, 2020, pp. 168-180), which is consistent with records of the 'plague', and consistent with the enormous resources expended by Djoser to relocate 40,000 pots from Abydos to Saqqara (Fritschy, 2018, pp. 161-176). Djoser was later commemorated for saving the country from plague, and elsewhere, the ancient text of the *Lamentations of Ipuwer* recorded a time when - plague stalked the land; a burning power went forth; women, beasts, and crops were barren; we know not what happened; all goeth to ruin; mankind is destroyed. A few senseless people divulged the magic spells of the cursed inaccessible place, the secrets of the lords whose limits were unknown (Erman, 1923, pp. 92-108).

Memory of the 'magic burning power' was preserved in Egyptian language as the *t<sup>2</sup>-dsr* (cleared, isolated) area surrounding the *per D'jet* underground storage vault, which passed down the generations into Arabic *Haram el-Mastabat*, the forbidden, prohibited tomb containing *illahat* evil spirits.

### Cancer In Modern-Era Egyptologists

The association of HC with ancient tombs prompts examination of the death records of modern-era Egyptologists and their associates, many of whom spent years excavating tombs. This study presents records of 505 field Egyptologists and associates who were active explorers, excavators, scholars, illustrators, collectors, curators, and traders of tomb ruins and artefacts in Egypt, mainly in the period 1800-2000. The occupations are not mutually exclusive; many prominent excavators were also collectors and later curators. Petrie is revered as a pioneering scientific excavator, but he also collected thousands of antiquities which are now in the museum at University College London; Carter is known for discovering Tut's tomb, but

he was later a collector and trader and was found to have illicitly kept several items from Tut's tomb; Henry Salt was nominally British Consul, but collected voraciously for the British, Ashmolean and Bodleian museums. The list also does not include the local workers who were directly engaged in primary excavations, nor the many unknown tomb robbers engaged by unscrupulous traders.

The data set is not amenable to formal statistical analysis for several reasons. The records of potential exposure are incomplete and not quantified; records of cause of death are anecdotal, not forensic; and there is no practicable means of establishing a baseline unexposed cohort for comparative analysis. The observations that follow are, therefore, largely indicative rather than statistically significant in the usual sense.

The first impression of the data set is that it presents a picture of many early, untimely deaths and a range of other sudden/unexpected deaths from poorly defined causes. Examples include many iconic names from early Egyptology. Belzoni, the archetype 'tomb raider' died at 45 of nominal 'dysentery'; Champollion, of hieroglyph translation fame, spent 1828-29 studying texts inside the pyramids at Saqqara, then died in 1932 at age 41 of 'exhaustion and apoplexy' (along with five of his companions); Rosellini, father of Italian Egyptology and associate of both Belzoni and Champollion, died at just 43 of 'suspected malaria'; Mariette, pioneering excavator at Saqqara, suffered illness and near-blindness before collapsing of violent haemorrhage and dying at 59; his successor, Maspero, retired early due to ill-health and collapsed and died at an academic seminar, aged 70; prominent British Egyptologist W. Emery spent many years excavating at Abydos and Saqqara until he collapsed inside a tomb at Saqqara and died within two days, labelled as 'stroke'; American G. Reisner spent years excavating the Giza mastabas, then at age 75 he collapsed inside the Great Pyramid and died of 'suspected poisoning'; another notable American, J. H. Breasted, on return from Egypt to NY collapsed and died of suspected strep infection possibly complicated by malaria; Lord Carnarvon at age 56, within weeks of opening Tut's tomb, suffered a mosquito bite that caused infection that led to strep poisoning that led to pneumonia and death; while Carter himself died later at age 65 of Hodgkin's lymphoma. Another curious example, possibly tangential, was the case of Napoleon, who led a military/scientific expedition to Egypt in 1798-1801, during which he explored ruins and (allegedly) slept overnight inside the Great Pyramid. He died at just 51 after suffering months of illness, nausea, vomiting, abdominal pain, and blood clots; diagnosed by autopsy as stomach cancer and since validated (Lugli et al., 2007, pp. 52-57).

These deaths, and many others detailed below, oc-

curred separately at different times and places without presenting a noticeable pattern. An excellent compilation of Egyptologists' biographies is available in *Who Was Who in Egyptology* (Bierbrier, 2012), but mostly without any details of the cause of death (COD). The survey here of 505 records, including COD, is derived from a range of public sources, including newspaper obituaries and tributes in Egyptology journals.

The exact cause of death was frequently not reported at all or was related anecdotally on the basis of general symptoms rather than on forensic examination. In early cases, the determination of COD may have been limited by the facilities of the time and place and was often characterised euphemistically as unfortunate ill-health and untimely death attributed to the harsh working conditions of excavations in Egypt. Of the total 505 records of active field Egyptologists, there were 119 cases of recorded sudden/unexpected/uncertain deaths, characterised by collapse, short illness and death, attributed to cancer or heart/stroke, or to general illness associated with gastro-intestinal effects, cardio-cerebro vascular effects, pulmonary/respiratory effects, and a range of secondary infections variously blamed on poisoning or exotic diseases. There is a sense in the early records that sudden unexplained deaths may have been conveniently labelled rather than diagnosed. Sudden collapse and death were labelled apoplexy, heart attack, or stroke; evident blood disorders were labelled as poisoning due to strep infections, possibly complicated by diabetes or malaria (or other exotic diseases), which were the recognised issues of the period. The concept of HC was not known; leukemia was not defined until the mid-1800s, and lymphoma was not defined until the very late 1800s and not routinely diagnosed until much later.

### Age At Death

Of the total 119 cases of recorded sudden/unusual/uncertain death, the average age was 60, versus an expected level of 60-70 for Western Europeans of that age group and period. Similarly, Nelson (2002), in an analysis of individuals present at the opening of Tut's tomb, showed an average age-at-death of 70 versus 75 for an unexposed control group. Those observations suggest a trend toward lower life expectancy for field Egyptologists, but not substantially so. Modern studies show that radiation effects have a widely variable latency period (Seibold et al, 2020, pp. 324-399).

### Cause Of Death (Appendix)

Recorded causes (or nominal labels) fall into four categories:

- [1] 17 cases of cancer, including three of haematopoietic cancer (HC). That incidence of 3.4% is at least 10 times the current expected rate in Western EU countries. (WCRF, 2021)
- [2] 19 cases nominally attributed to apoplexy/heart attack/stroke; taken at face value, an incidence of 3.8%, which is over 10X the current expected rate in western EU countries (less historically).
- [3] a further 55 cases (11%) attributed loosely to 'illness', characterised as respiratory issues (pneumonia), blood poisoning, haemorrhage, diabetes, disease (malaria, cholera, typhus, plague), fever, dysentery or even insanity.
- [4] another 28 cases recorded as sudden/unexpected death, but undiagnosed.

In the remaining 386 cases, the COD is unknown or inaccessible but included 52 instances of abrupt early deaths (<50 years).

While some individual cases may be unreliable or merely coincidental, the collective weight of numbers is strongly indicative of an unusual profile of deaths specifically to cancer, nominal heart/stroke, or vaguely to 'illness'. The rates of cancer (3.4%) and nominal heart/stroke (3.8%) are in the order of 10X the expected baseline rates for Western Europeans (less historically and less in undeveloped countries).

### Particular Sub-Clusters

**The Franco-Tuscan Expedition.** Champollion's expedition of 1928-29 spent months studying the *Pyramid Texts* inside the pyramids at Saqqara, following which six team members met early, unusual deaths; Champollion (of hieroglyph fame) at 41 of exhaustion/apoplexy; Bertin at 29, unknown; Rosellini at 43 of 'malaria'; L'Hote at 38, of frail health; Ricci at 39, attributed to infection from a scorpion sting; and Lenormant at 57, of fever.

**Collectors/traders.** There is a suspicion of linkage to the handling of Egyptian artefacts among the early tomb robbers and traders, several of whom met early deaths. Ballerini died at 33; Ricci at 39; Belzoni at 45 (of 'dysentery'); Salt died in Egypt at 47 after collecting extensively for British museums; Lebolo at 49 and D'Athansi at 56, were both noted collector/traders; Carter died at 65 of lymphoma after collecting widely, including items taken improperly from Tut's tomb; and Drovetti died at 76 in an insane asylum.

**Illustrators.** There were 34 individuals listed as illustrators who might have been expected to spend long hours inside tombs copying inscriptions and murals.

Many met very early deaths (30-40), and the average age at death was 55.5, versus a total group average of 60 and an expected European average of 60-70. Reported COD included one case of leukemia (A. Quibell) and other characteristic cases ascribed to poisoning (Ricci), diabetes (Burton), and variations of illness/pneumonia/stroke (Firth, Jones, Legrain, H. Petrie)

**Tut's tomb.** Despite the scepticism relating to Tut's tomb, it remains intriguing that a number of those associated (before, during, and after) died unusually. Carter himself died at 65 of lymphoma; Carnarvon at 56 of blood poisoning; Bethell at 46 of asphyxia; Lythgoe at 65 of cerebrovascular disease; Burton at 60 of diabetes; Lucas at 78 of heart failure; Gould at 59 of fever and pneumonia; Mace at 53 of uncertain poisoning/pneumonia; Breasted at 70 of strep infection/malaria; and Reid at 53, ironically of X-ray exposure (possibly pre-existing). Weigall was an independent excavator and later journalist at the opening of Tut's tomb, where he was accused of inciting the 'myth' of the curse. Ironically, he died early at 54 of cancer.

Overall, this data set of modern-era field Egyptologists and associates known to have been exposed to ancient tombs reveals a pattern of strongly elevated incidence of sudden/untimely/unusual deaths accompanied by symptoms characteristic of underlying haematopoietic cancer caused by exposure to ionising radiation. This syndrome is now recognised as radiation sickness (or poisoning) and affects the hematologic, gastrointestinal, cardiovascular, and central nervous systems. Bone marrow damage causes pancytopenia, resulting in increased susceptibility to infections and clotting abnormalities. Progressive symptoms include lethargy, exhaustion, headaches, nausea, vomiting, diarrhoea, fever, haemorrhage, diminished vision, respiratory distress, mental impairment and secondary infections, climaxing in total collapse and death by respiratory or cardiac failure. (Mole, 2016). Apparent inconsistency in the severity and timing of effects is also recognised in modern studies, which note wide variations according to dose, latency, and individual sensitivity. (Seibold et al, 2020, pp. 324-399).

The indication of radiation poisoning is consistent with the legendary curse of the ancient mastaba tombs, which were *haram* (forbidden, prohibited) because of *il-lahat* (evil spirits) causing a disease no doctor could diagnose. The question remains as to the ultimate source of the unusual (unnatural?) levels of radiation previously reported.

## Background Context

The orthodox view of the mastaba as a tomb reflects a humanised religious interpretation of ancient Osirian

funerary rituals. From earliest times, the humanoid 'god' Osiris was known as the son of the Sun god (*Ra*) manifested on Earth to save mankind from darkness. Osiris 'died' but was resurrected. His dead body was ritually prepared, fed with cakes and ale, then placed within a stone chamber where it magically *transformed* into incandescent light and ascended into the sky to be reunited with God the Father in the heavens. The earliest Egyptians of the Old Kingdom believed this process was literally, physically true, accomplished by alchemy or magic, not understood by ordinary men. Contemporary Egyptologists have designated the pyramid as a "resurrection machine" (Edwards, 1961, p. 286) or "cosmic engine" (Lehner, 1997, p. 20), a structure or mechanism that enabled the *transformation* to take place.

Following the hiatus of the First Intermediate Period (ca. 150 years, 5-6 generations), ordinary Egyptians inherited the Old Kingdom funerary literature, which was reputed to hold great secrets. The ancient texts cautioned against revealing the mysteries - this book is secret, do not show it to common people, let no one see it. Common people are ignorant of this book. Do not show it to any other person. [It] is a true mystery which is known by no man anywhere (Faulkner 1969, Utt. 484; Faulkner, 1972, Sp. 161). The *Book of the Dead* also made a distinction between the prior kings of the Old Kingdom versus ordinary mankind who were characterised (in translation) as 'common folk' (Faulkner, 1972, Sp. 38B, 42, 65, 69, 161, 182); noting that the transformations of Osiris [into light] were not understood by mankind, because it was an exceedingly great mystery which no man knew. It was an abominable thing not to be disclosed to those who dwell in the swamps. (Budge, 1895, pp. 187, 217, 219; Budge, 1901, Chapt. CLXIII, p. 535). The magic of transformation was not just a secret but a terrible, dreadful thing not to be revealed.

The old texts were overlaid with symbolic religious rituals and language in a childlike attempt to imitate the earlier gods, but there remains clear textual and physical evidence of the original literal content.

The outcome was vividly recounted in the funerary texts, albeit in personified language. Osiris came forth from the House of the Rising Sun (*akhet*, horizon), from the Island of Fire, where his body was filled with magic. Flame went up from the pyramid, causing fear and trembling in those who watched. He rose in the mountain (pyramid) with a double plume of rays of turquoise light to the height of heaven, flooding the world with light. The [two] apertures of the sky windows were opened, the sky reeled, the earth quaked (Faulkner, 1969, Utt. 477, 479, 482, 485, 503, 508-510, 536, 584, 604; Faulkner, 1973, Sp. 30, 283, 317, 422, 573, 609, 650, 707, 753, 849).



The source of the power of *transformation* was the invisible 'efflux' from the magic offerings. Osiris declared (in the *Coffin Texts*) - I have power by means of offerings; I go forth by means of the efflux; by means of the magic; take the efflux so you shall not be inert; go forth from the burning fire; I have eaten the magic of the spirits of the magic food; the souls are in me, the shades are in me; I am transformed into mighty spirits; I shine in the sunshine, from the efflux. I am the primeval one; my soul possesses power in its primeval form. (Faulkner, 1973, Sp. 95, 101-2, 246-7, 317, 469, 573, 690, 705, 824, 829, 936, 895).

The magic food was detailed as *tchefau*, light food in the form of cakes and ale (or bread and milk). Cakes of saffron were brought to him [Osiris]; he was given saffron cakes in the coffer; the cakes of saffron are the eye of Horus. (Budge, 1895, Chapt. XVII, pp 52-53, Figure 1). Saffron (yellow) cake was further detailed in a series of Food Spells in the *Coffin Texts* where the efflux came from magic food of [unknown hieroglyph] in portions of 2-3-5; the movement of the sunshine was provided in meals of 2-3-5 portions (reversed in the hieroglyphs) (Faulkner, 1969, Utt. 205, 409; Faulkner, 1973, Sp. 191, 209, 211, 212, 217, 218, 587, 659, 667; Figure 2).

Yellowcake-235 is recognisable now as the crude ore of uranium-235 (U<sub>235</sub>), the primary fuel of modern nuclear technology. Crude yellowcake is insufficient to cause a nuclear reaction and must be enriched to a higher concentration, which has the form of a chilled milky liquid. That process was also detailed in the *Coffin Texts* in recognizable terminology. The food [yellowcake] was made

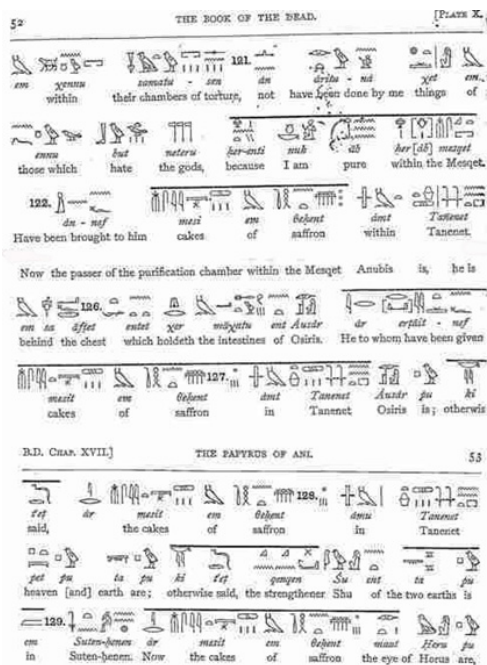


Figure 1. Saffron [yellow] Cake in the *Book of the Dead* (Budge, 1895).

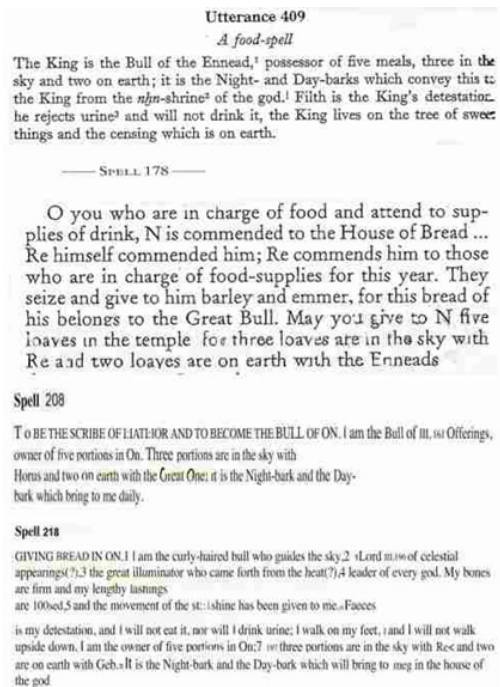


Figure 2. Text Examples of 'food supplies' Characterized in Portions of 2-3-5. (Faulkner, 1969,1972,1973).

pure, and the milk was restored to its proper level. Osiris declared - I am the son of the Milk Goddess. My mother gave censuring of incense (efflux). I suckled my mother (for milk) of the rotting putrefaction (decay). He swallowed the spirits; he received pure offerings whose names and shapes were unknown. (Faulkner, 1973, Sp. 529, 467-8, 335, 306, 1017). Elsewhere the *Pyramid Texts* presented similar detail - Osiris received the milky fluid from the breasts of Isis; he received the efflux from the cold drink; the efflux of decay; the cold drink is yours, efflux is yours, the powers are in it. (Faulkner, 1969, Utt. 413, 470, 661, 423, 536, 553, 676, 679).

Physical evidence of intense fire may still be observed inside the Great Pyramid. The funerary text description of the Cooking Pot in the House of the Rising Sun (*akhet*) corresponds to the upper King's Chamber, where the double plumes of fire emerged through the two vent shafts, observed by early archaeologists to be scorched and blackened by fire that darted through them. (Vyse, 1840, II, p. 160, 201, 212) The intensity of the fire raised the roof beams, as noticed by Petrie, who recorded that the walls had expanded by an inch or two and roof beams were cracked and raised out of position by 3 inches (75 mm). (Petrie, 1883, p. 80, 93). The internal walls of the King's Chamber were initially misreported as polished marble because they reflected torchlight, but they are actually granite, which glistens because the surface is vitrified by extreme heat. The stone coffer is composed of ordinary grey granite, but its surface has an unnatural chocolate

brown colour, as if baked by extreme heat, and the edges show signs of melting (Dunn, 1998, pp. 211-212; Petrie, 1883, pp. 80, 93; Vyse, 1840, pp. 41, 83).

It follows that the expression of uranium-based technology would also develop radioactive waste products that would have to be managed by burial, for which there is also textual and physical evidence. In Egyptian legend, on the death of Osiris, the pieces of his body were enclosed in a lead-lined coffin and buried deep underwater. That scenario is consistent with the structure of the Osiris tomb at Giza adjacent to the pyramids, which consists of a 30 m deep vertical shaft filled with water, at the bottom of which was a dense dacite sarcophagus of ca. 30-40 tons. Basalt coffers at level 2 (ca 20m.) have been examined by the Geiger counter and found to be intensely radioactive, particularly on the inside (Temple, 2010, pp. 43-80, 297).

Finally, the *Book of the Dead* states directly that the dead body of Osiris is excrement [waste], which is everlasting. It cautioned mankind to get back (away) from the corpse, where the guardians of the tomb of Osiris held back the harmful spirits. Get far away from the shades of the dead - the *ka* (soul) - lest the slayers grasp you. Finally, the King says, in naïve personalized translation - I hate filth, I detest faeces, I reject urine (wastes), what I hate is buried in the cavern of the underworld [underground?], where those things cause fear and terror (Budge, 1895, pp. 31, 173, 336, 338; Faulkner, 1972, Sp. 92).

The waste excrements of dead Osiris contained harmful spirits that were everlasting and were buried in an underground bunker, in the *pr dj't*, house of millions of years.

## Radiation Source

Unusually high radiation levels have been documented in Old Kingdom tomb ruins; in two locations at Giza and as radon in several underground tombs at Saqqara. Radon (Rn-222, Rn-220) is a radioactive gas emitted from decay of uranium, with a half-life of 3.8 days. The reports detected ambient radioactivity but did not identify the primary source.

Radiation has been detected by the Geiger counter at two sites at Giza adjacent to the pyramids. The readings were described as intensely radioactive in the magazines in the basement of Khafre's Valley building; while underground at level-2 of the Osiris tomb shaft, intense radioactivity was associated with two stone coffers, especially from the interiors. (Temple, 2010, pp. 43-80, 297). Temple described the coffers as granite, but Hawass (2007, pp. 379-397) classified them as basalt. The distinction is important because natural low-level radioactivity is rec-

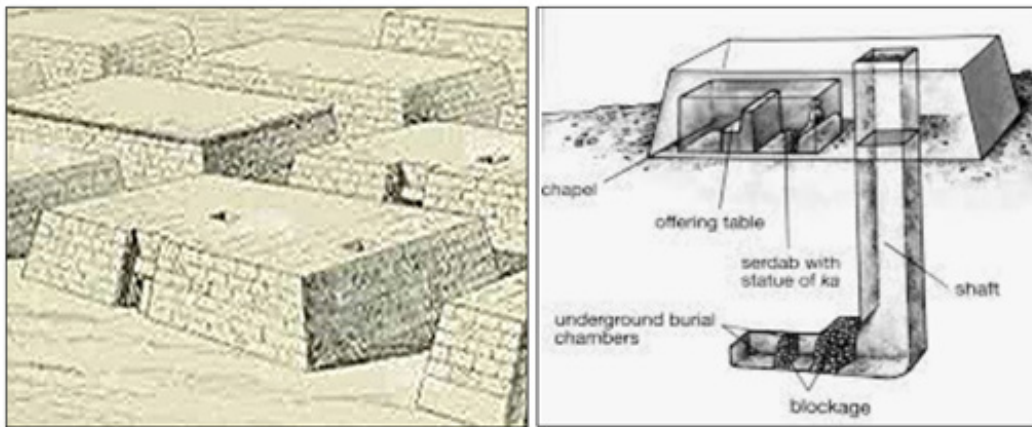
ognised in coarse-grained granite, less so in fine-grained denser granite (diorite), and rare in basalt or limestone (Hurley, 2009, p. 14). Temple also noted that the coffers, particularly the interiors, were a point source of radiation, as opposed to general trace natural levels (of radon) from the surrounding limestone bedrock.

Other studies have directly measured radon gas at various locations in tombs at Saqqara. Radon gas is an intermediate product of uranium decay, with a half-life of 3.8 days. It is ubiquitous at low levels and is generally regarded as a natural product of traces of uranium in parent rock. Chen (2023, pp. 244-256) reported a worldwide study of 474 underground non-uranium mines, which found an average 'natural' level of radon of 574 Bq/m<sup>3</sup>, a number inflated by extreme levels in phosphate deposits and in inactive unventilated mines. The WHO reference level for radon in indoor air is 100 Bq/m<sup>3</sup>; the USEPA advisory level is 150 Bq/m<sup>3</sup>; and the ICRP reference level is 300 Bq/m<sup>3</sup>. Levels above 200 Bq/m<sup>3</sup> pose a significantly increased risk of lung cancer (Salama et al., 2018, pp. 950-956).

Studies in the ruins at Saqqara measured ambient radon concentrations at six locations: in the South Tomb, in the magazines of Djoser's pyramid, and in the Serapeum tomb tunnels. Measurements ranged from 1068-2866 Bq/m<sup>3</sup> in winter and 2394-4592 Bq/m<sup>3</sup> in summer, with the highest readings in the South Tomb (2866-4077 Bq/m<sup>3</sup>) and position-3 in the Serapeum (2387-4592 Bq/m<sup>3</sup>). (Salama et al., 2018, pp. 950-956). These levels were locally variable (within a site), an order of magnitude above maximum advised limits, and up to an order of magnitude above expected 'natural' background. The authors implicitly acknowledged the inconsistencies and proposed an explanation based on seasonal temperature and ventilation. They did not verify the natural level in the limestone, which is otherwise recorded as nil or rare (Hurley, 2009, p. 14), nor did they acknowledge that radon is a gas that might otherwise be expected to equilibrate within a closed tunnel system over an undisturbed measurement period.

Further studies at three locations in Old Kingdom ruins at Saqqara reported radon detections of 5809 Bq/m<sup>3</sup> (in the Sekhemkhet pyramid), 1202 Bq/m<sup>3</sup> (Abbis tunnels), and 816 Bq/m<sup>3</sup> (Serapeum tomb), an order-of-magnitude above maximum advised limits, and well above average 'natural' levels (Bigu et al., 2000, pp. 245-252). Those results were publicised under the heading "Pharaohs left behind a radioactive curse" (Edwards, 1999).

These measured levels of radiation are anomalous in magnitude and in localised distribution. Consideration of this unnatural profile of radiation prompts further examination of ancient Egyptian texts and archaeological



**Figure 3.** Typical Early Old Kingdom Mastaba, with Orthodox Labels (Wikipedia Commons).

records of the structure and operation of early mastaba tombs, revealing unexpected evidence that the original purpose of the *per D'jet* (secure house of millions of years) was consistent with long-term storage of nuclear waste of uranium-series decay products.

### Mastaba Tomb Structure

The mastaba tomb of the Ancient Egyptian Old Kingdom began as a simple shallow pit, then evolved into a rectangular slab structure above ground, enclosing two small internal chambers and a 30 m deep vertical shaft extending to an underground burial chamber (Figure 3).

Key features of the typical early structure include:

- The 30 m deep shaft to the off-set burial chamber was deliberately loosely back-filled with rubble, with the upper section extended through the superstructure to an obvious external opening. The shaft and opening were not hidden and not secured in any way against later unauthorised entry.
- The first internal chamber enclosed a 'ka' statue and



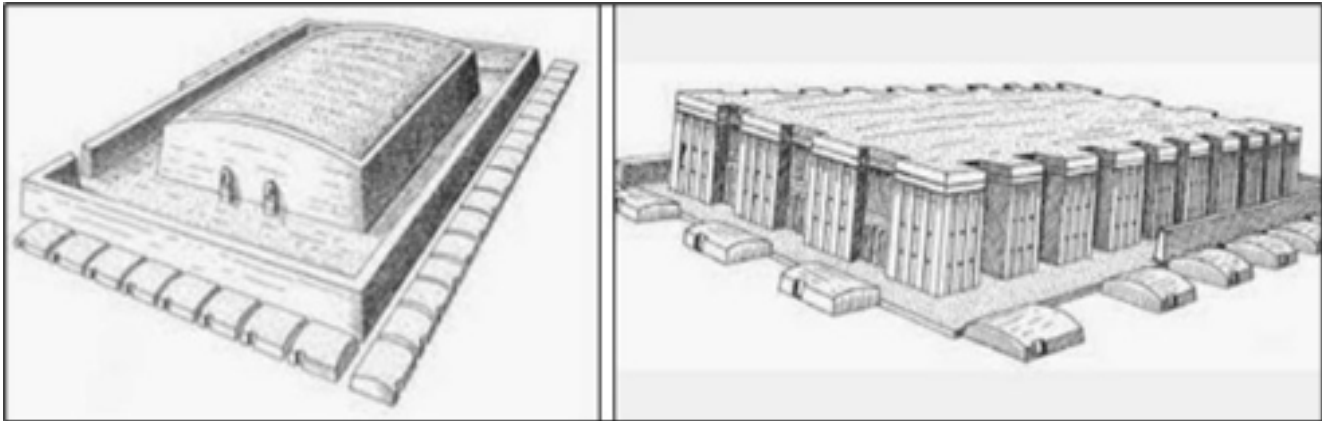
**Figure 4.** Regular Array of Mastabas in the 'royal cemetery' at Giza (4<sup>th</sup> dyn). (Reisner & Fisher, 1913).

had a series of small external openings at the top, like ventilation holes.

- The second chamber included a stone shelf, designated by early Egyptologists in religious terms as a chapel and altar for food offerings.
- Numbers of identical mastabas were set out in regular rows and columns (dubbed a cemetery by early Egyptologists) or arranged systematically around a larger central building (Figure 4, 5).

It was clear to early archaeologists that these classic mastabas were of a single design and were arranged systematically in a unified construction project. They were not personalised according to the status or whim of a particular decedent. Similarly, the earliest mastabas were plain, undecorated stone or brick, without any trappings that might be expected of high status. It was only much later re-use, or later imitative copies, that introduced the confusion of intrusive burials and illustrative murals. And finally, the earliest mastabas explored by Petrie at Abydos and Reisner at Giza were lacking any trace of a mummy, body, or bones (Frankfort, 1961, p. 92; Petrie, 1900; Reisner, 1927; Reisner & Fisher, 1913). Not just missing as if later robbed, but forensically empty of any sign whatsoever of use as a human tomb. Even in the classic case at Giza, where Reisner discovered an intact sealed stone coffer, when it was winched open, it was found to be empty.

It is also notable that the early mastaba design remained unchanged over a long period. Current doctrine claims the single slab mastaba evolved into a multi-layer step-pyramid design and eventually into a true smooth-sided pyramid. But observation shows that the original classic structure persisted over about 750 years from the early dynasties at Abydos to the 4<sup>th</sup> dynasty at Giza to the 5<sup>th</sup>-6<sup>th</sup> dynasties at Saqqara. The mastaba appears as an ancillary building rather than developmental.



**Figure 5.** Systematic Arrangement of Mastabas. (Wikipedia Commons).

**Mastaba Etymology**

*Mastaba* is an Arabic term recorded by European Egyptologists in the early 1800s, where the local Arab workers referred to the collective ruins as *Haram el-Mastabat* (forbidden mastaba), which they declined to approach because of fear of *illahat* evil spirits.

*Mastaba* was interpreted by early Europeans as meaning ‘bench’ because it supposedly resembled a local domestic bench (seat) *when viewed from a distance*. But the mastaba structure is grossly oversized, disproportionately wide with impractical sloping sides, and encloses small rooms and a shaft, which are all quite inconsistent with a bench seat. Modern *mastaba* is from earlier Persian, which relates not to modern English bench, but rather to Old English *benc*, related to Latin *banc*, *banque*, or Celtic *bunke*, from which we get bank and bunk/bunker, meaning a vault for safe storage of something valuable or noxious. The association of *mastaba* with *benc* relates

not to the above-ground shape but to the below-ground function. It was a vault or bunker.

In Egyptian texts, the vault structures were called the *pr D’jt* (*per D’jet*), meaning the ‘house of stability’ or ‘house of eternity’ (literally millions of years), deriving from 1st dynasty King D’jet at Abydos, who was associated with planning/designing the underground basement. The *pr D’jt* was an underground chamber of stability (or security), also known as the ‘house of the *ka*’ (one of the aspects of the soul or spirit, together with the *ba*), located in an area called *t<sup>3</sup>-dsr*, meaning the ‘secluded, cleared, isolated land’, or the *crk-hh*, meaning ‘securing for eternity’ (Jackson, 2014).

A recent review of mastaba mural illustrations (from later periods) observed that the main activity portrayed was the carriage of offering pots to the mastaba *during the lifetime* of the King, as opposed to after death. The primary illustrated function was as a storehouse or depository for offerings (Zeinelabdein, 2018, pp. 180-195). It was an underground vault for stable storage of ‘something’ in pots for millions of years. The *t<sup>3</sup>-dsr* (isolated) zone became the Middle Kingdom religious sacred precinct, derived from sacrosanct (untouchable), which passed down to Arabic *haram* (forbidden).

**Mastaba ‘Offerings’**

Physical evidence and illustrative murals indicate the original primary function of the mastaba was as an underground vault for permanent long-term storage of very large quantities of ‘offerings’ contained in stoneware pots. It is popularly perceived now that the offerings of beer or wine were intended to appease the gods and/or to sustain the deceased on his journey into the eternal after-life. But those misperceptions were clouded by the later overlay of humanised religious rituals of Middle Kingdom priests, doubly reinforced by Euro-Christian Egyptologists who imposed a religious interpretation on the line



**Figure 6.** Stacked Pots Suggesting Storage Rather Than Ceremonial ‘offerings’ (Emery, 1961; Jackson, 2014).

of bearers as a 'funerary procession' carrying oblations to be offered to the gods on an altar inside a chapel. In fact, the original offerings, in thousands of *stoneware* vessels, did not contain drink and were not offered ceremonially on the altar but stacked rather prosaically in the underground chambers (Figure 6).

Placement of vessels took place during the lifetime of the King; it was not associated with a funeral or interment of a body or mummy. The primary function actually illustrated was *storage*, not ceremonial oblations. It was a very large-scale systematic industrial process involving thousands of manufactured stoneware pots. Notably:

- There were literally thousands of pots. The tomb of 1<sup>st</sup> dynasty King Aha contained 200; tomb S3504 from the time of 1<sup>st</sup> dynasty King Dj't contained 4000; and Khasekhemwy's 2<sup>nd</sup> dynasty tomb contained 10,000. A total of 40,000 *stoneware* pots were later transported from 1<sup>st</sup>-2<sup>nd</sup> dynasty tombs at Abydos to be re-buried in the galleries deep beneath Djoser's Step pyramid at Saqqara (Fritschy, 2018, pp. 161-176).
- The pots were mainly made of dense stone, including basalt, diorite, and porphyry, mass-produced by unknown means to a very high standard with smooth surfaces inside and out (Takenouchi, 2021, pp.177-190).
- The pots were not positioned in a stylised ceremonial or ritualistic manner but rather were mundanely stacked for storage in underground chambers (Figure 6).
- The whole process was organised systematically, directed by a lector (instructor), recorded by an accountant or archivist, then guarded by a permanent *k3* priest, and subject to later checks by a travelling inspector (Zeinelabdein, 2018, pp. 179-198).
- The pots came from a central facility called the *pr-hd*, translated as the 'treasury' or 'house of stone' or 'house of the mace' (a weapon), responsible for producing the pots and/or the contents. (Fritschy, 2018, pp. 161-176).
- Most pots were uninscribed, but some were marked with a *phyle* name, designating the group or team who made or filled them (Takenouchi, 2021, pp. 177-190).
- Some pots at Abydos carried labels or tags made of bone (to last for eternity), marked with curious symbols, including a goose, a dove, and a snake (Dreyer & Kaiser, 1988).
- Many caches of stored pots were excavated very early, in the 1800s, and were speculated to contain unguent, beer, or wine (as later pottery vessels did). But the actual contents were a kind of oil, mud, plaster,

mortar, or ash (Takenouchi, 2021, pp. 177-190).

These features paint a picture of large-scale industrial operations. In the 3<sup>rd</sup> dynasty, an early mastaba at Saqqara was extended into a multi-layer structure that is now known as Djoser's Step-pyramid, and thousands of pots were moved from Abydos into new permanent storage in the magazines deep under the Step-pyramid. It was not a ceremonial oblation; it was a massive industrial-scale undertaking termed the 'refreshment', meaning renewal or reinstatement. It was as if the Abydos site had deteriorated over the centuries and had to be replaced. Egyptologists have noted the enormous scale of construction and logistics. Djoser's pyramid covered 15 ha within a 10.5 m high wall defining the forbidden zone, with literally miles of tunnels deep in the underlying limestone, along with the transport of 40,000 pots from Abydos to Saqqara, a task which Egyptologists have interpreted as an exercise in royal pomp and ceremony. Yet the end result was a *sacred* exclusion zone from which men were barred by a 10.5 m wall and 40 m. wide outer moat.

Despite the usual interpretation of early Egyptologists that the offering pots 'must have' contained drink or food, the actual determination of the contents as mud, plaster, or mortar has defied orthodox explanation and remains to be seen.

### Mastaba Symbols

The above background provides a new perspective to interpret otherwise enigmatic symbols of ancient Egypt, such as the pot tags (labels) found in early tombs at Abydos and the so-called offering scenes illustrated in later mastaba murals. The explanation of ancient symbols has been doubly confused. First by the humanised imagery of Middle Kingdom priests, where it is difficult to distinguish if they were simply ignorant or if they deliberately used cartoon characters to communicate complex concepts. Secondly, by the lapse of time, where mastaba murals of the Middle Kingdom (ca 2000 -1500 BCE) are already ca. 500 to 1500 years after the original events.

Modern physics distinguishes *two classes* of nuclear radioactivity. Particle radiation (alpha and beta) and electromagnetic waves (gamma). Alpha particles (helium-4 nuclei) are relatively large, slow, and weakly penetrating; beta particles (electrons) are very small, highly active, and mildly penetrating; and gamma rays (e-m waves) travel only in straight lines, are highly penetrating and very damaging to bone marrow causing haematopoietic cancers.

Correspondingly, the Ancient Egyptian scheme presented *two types of soul* or *spirit* that emerged from the 'dead body' of Osiris - the *ba* and the *ka* - designated as



**Figure 7.** The 'ba' Spirit Symbolised as a Bird (Wikipedia Commons).

aspects of the 'soul' in 19<sup>th</sup>-century quasi-religious language. Puzzlingly, the *ba* and *ka* left the body but didn't go away; they hovered around forever.

The *ba* was initially visualised as an abstract bird symbol, a flying object, or, in later, religious imagery with a human face (Figure 7).

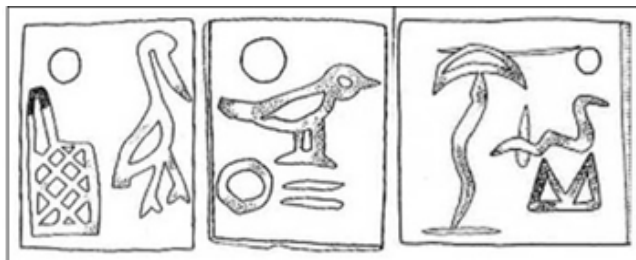
Pot tags from Abydos (3400-3200 BCE) distinguished two kinds of birds, corresponding to the modern designation of alpha and beta particle radiation (Figure 8).

Alpha radiation (large, slow He-4 nuclei) was represented as a large, slow-moving goose.

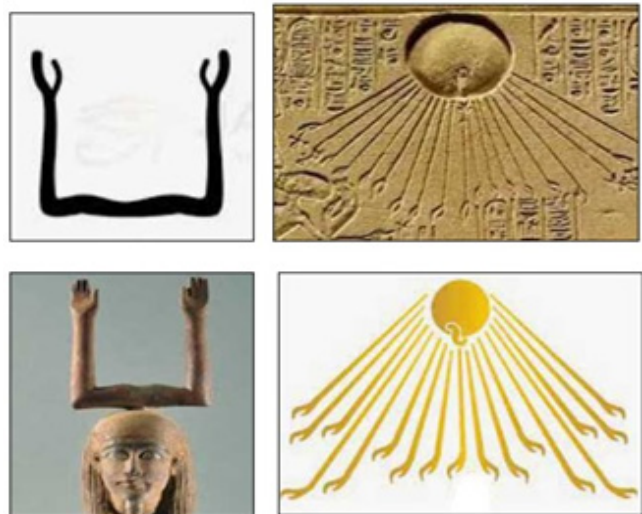
Beta radiation (small active electrons) was represented as a small active bird (identified as a turtledove or a sparrow, often illustrated escaping up the vertical shaft of the mastaba. The common sparrow was the archetypical 'bad bird' representing harm and evil. (Bailleul-Lesuer, 2016, p. 10; hieroglyph G37, Gardiner, 1927).

The *ka* was believed to be potent and dangerous and was initially visualised as an abstract snake-headed symbol, only later humanised into upright human arms and hands. The snake subtly captured the sinuous motion of e-m waves, set at right angles to indicate straight line movement, and with the snake head representing the venomous bite causing fatal blood poisoning. Elsewhere, the 'snake-bite' symbol was also recognised as the insidious hazard of solar radiation. The ability of 'ka' waves to penetrate stone was captured in hieroglyphs as the sign for a shrine or naos, a stone box containing the gods, but from which the *ka* 'snake' could still escape, illustrated in a mastaba mural (Figure 9,10).

The child-like imagery of radiation features as the



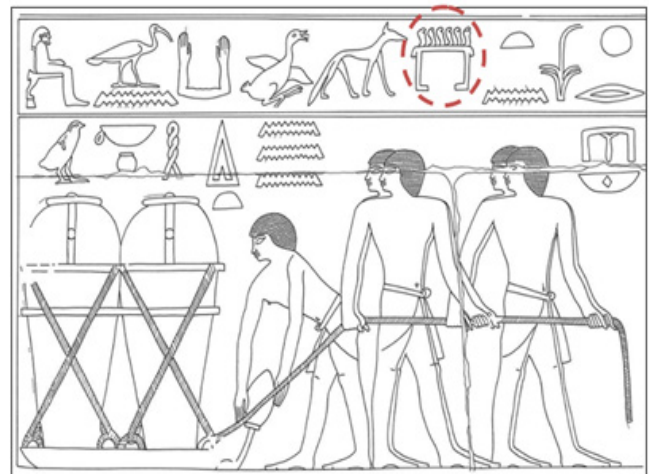
**Figure 8.** Pot Tags from Early Burial Vaults at Abydos – Goose, Sparrow, and Snake (Dreyer & Kaiser, 1998).



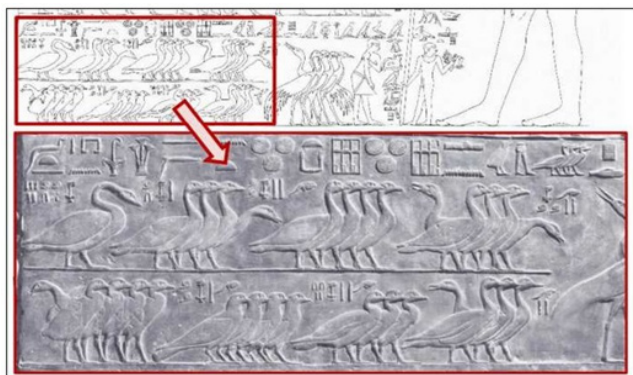
**Figure 9.** Fatal Gamma Waves Illustrated as the Venomous 'ka' Snake (Wikipedia Commons).

snake (waves) and birds (flying entities) was reinforced elsewhere in the *Pyramid Texts*, which described how the glory (radiance) of the light was inhuman (unnatural), appearing like the sun with spirits of "water and sand" (Faulkner, 1969, Utt. 565). That apparently fatuous expression may be interpreted in context as naïve imagery for 'waves' and 'small particles', e-m gamma waves, and small alpha and beta particles. The childish innocence of this imagery suggests an intellectual gap between the original authors in the Old Kingdom versus the 'common men' who were copyists and priests in the Middle Kingdom, perhaps 500-1000 years later.

Long-life radioactive wastes are ranked today by activity x quantity x longevity, and on that basis, two of the most troublesome isotopes are technetium (Tc-99) and caesium (Cs-135) with half-lives of 211,000 and 2.3 mil-



**Figure 10.** Mastaba Mural Illustrating Storage of Pots Containing 'ka' (snakes) and 'ba' (birds) (Linacre College, 2006).



**Figure 11.** Mastaba Mural Illustrating Exact Large Numbers of Birds ('ba' spirits) (Bailleul-Lesuer, 2016).

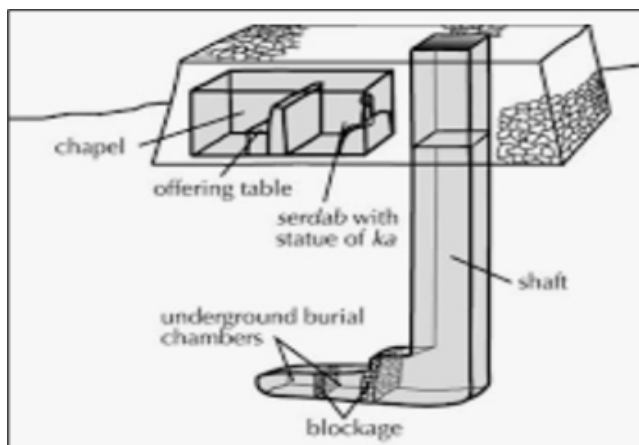
lion years, respectively. Correspondingly, mastaba murals illustrate offerings of curiously exact, very large numbers of specific birds. The numbers vary in expression, suggesting they may have been corrupted by copying from some prior source. There are examples of 111,200 doves, 11,110 'birds', and 120,000 or 121,200 ducks or geese. (Bailleul-Lesuer, 2016, p. 613; Zeinelabdein, 2018, p. 190). These large numbers of specific birds suggest a code indicating the expected lifetime of the offering wastes stored in the *pr dj't* house (Figure 11):

- 111,200 doves x lifespan <2 years = ca. < 222,400 years = ca. half-life of Tc-99
- 120,000-121,200 geese x lifespan <20 years = ca. 2.4 M years = ca. half-life of Cs-135

**Mastaba Mechanics**

Why was the mastaba built in a systematic configuration, and how did it operate? The storage process was formally managed by a lector (instructor), an accountant/archivist, a K3 priest permanent monitor/caretaker, and a travelling inspector. (Zeinelabdein, 2018, pp. 193-194). The background of nuclear waste storage for millions of years allows interpretation of the structure and operations, as follows (Figure 12):

- The burial chamber was 30 m deep in bedrock as a physical barrier to limit the escape of radiation, particularly gamma rays.
- The offerings (wastes) were contained in very hard, dense stone vessels (later coffers) to contain penetrating radiation.
- The contents of the offering pots were semi-solid mud, mortar, or plaster, consistent with a strategy to physically immobilise the radiation source rather than allow the development of hot spots or leakage of liquids.



**Figure 12.** Typical Mastaba Structure, with Orthodox Labels (Wikipedia Commons).

- The burial chamber was offset from the shaft to limit the escape of gamma rays (*ka*), which only travel in straight lines.
- Mastaba murals showed some smaller *ba* birds (beta particle radiation) escaping up the vertical shaft. (West, 2019, p. 3).
- The shaft was deliberately loosely backfilled with broken rubble for two possible reasons: (a) for aeration to prevent overheating, or (b) to allow the subterranean chamber to be periodically filled with water as a moderator. There is no direct evidence of that, but it is consistent with the Osiris tomb and other textual references and with modern practice.
- In the above-ground cap, the inner chamber was located directly above the underground burial chamber, the shortest distance at which to detect possible leakage of gamma rays (*ka*). This chamber contained a *ka* symbol, indicating it was 'for the *ka*'. The chamber was ventilated by small holes at the top and was used to contain live bird(s) that acted as 'mine canaries' to detect possible leakage of *ka* (gamma radiation). Numerous texts refer to the ongoing delivery of live birds to the mastaba, probably the sacred ibis. Hebrew historian Josephus recorded that ancient Egyptians used caged ibes to detect evil 'snakes'. Birds, in general, are known to be acutely sensitive to radiation.
- The second (outer) chamber contained an 'altar' (shelf) used to present food offerings, which was a second strategy to detect sterilizing irradiation. If the food did not decay normally, that indicated the presence of sterilizing gamma radiation.

But before this level of ordered structure and management, the early 1st-2nd dynasty tombs at Abydos were more basic. Some were only relatively shallow pits with little or no covering superstructure or superstructure that deteriorated over time. A series of circumstanc-



**Figure 13.** The Step Pyramid Complex (Wikipedia Commons).

es is consistent with radioactive leakage from these early tombs at Abydos:

- The Egyptian funerary texts state directly that Abydos was the site of the refining/enriching of the magic efflux - I have come that I may establish offerings in Abydos; pure is the efflux which was drawn from you; may you be mighty [stronger] in Abydos. (Faulkner, 1972, Sp. 117-119).
- According to Mantheo's History of Egypt, at the time of the 1<sup>st</sup> dynasty, under King D'jet, a very severe 'plague' affected that land.
- Hundreds of secondary non-elite graves at Abydos contained young men of 20-25 (and some women and dwarfs) apparently in good physical condition, uninjured, but speculated to have been poisoned (Recht, 2020, pp. 168-180). A similar scenario was reported at Kerma (Barta, 2011, pp. 63-65), where there were 30,000 graves in a small industrial town suggested elsewhere as a site of yellowcake U-235 mining/processing.
- Other studies of non-elite skeletons from the Old Kingdom have shown a significant incidence of degenerative joint disorders of the spine and cranial porosity, attributed to famine (or plague) but also known to be directly caused by radiation exposure. (Mant, 2014,

p. 27)

- Around 2650 BCE, about 40,000 pots were disinterred from Abydos and transported downriver to be reburied deep underneath a massive new multi-layer mastaba (Step pyramid) at Saqqara. (Fritschy, 2018, pp. 161-176).
- The remaining empty tomb structures were deliberately purged by fire, consistent with a strategy for decontamination. (Emery, 1961, p. 97; Petrie, 1904; Richards, 2002).

The relocation event was called the 'refreshment of the gods' in 19<sup>th</sup>-century anthropomorphic language, better interpreted as remediation or literally reburial.

### D'joser's Step Pyramid

The early tombs (burial vaults) at Abydos extended over a period of 4-500 years, from the late-predynastic through the 1<sup>st</sup> and 2<sup>nd</sup> dynasties, after which it must have become apparent that the initial design of shallow pits was allowing hazardous leakage of radioactivity causing 'plague'. Around 2650 BCE, King Djoser is credited with the massive clean-up of Abydos, removing ca 40,000 storage pots and reburying them under an expanded step pyramid 500 km downstream at Saqqara.

The step pyramid began with the classic design of a 30m deep vertical shaft, capped with an above-ground slab, square-shaped to accommodate the wide dimensions of the shaft and burial chamber below. That basic design was then extended in two further stages by widening and raising the superstructure to a total of six tiers, forming the now familiar Step Pyramid. The widened and raised superstructure served to shield a huge network of lateral magazines tunnelled into the bedrock below at the level of the original burial chamber (ca 30m). Into that deep subterranean complex, they re-interred about 40,000 pots of waste from the 1<sup>st</sup> to 2<sup>nd</sup> dynasty tombs at Abydos.

The final outcome was a Step Pyramid of 62 m. high



**Figure 14.** The Step-Pyramid Construction Phases (Wikipedia Commons).





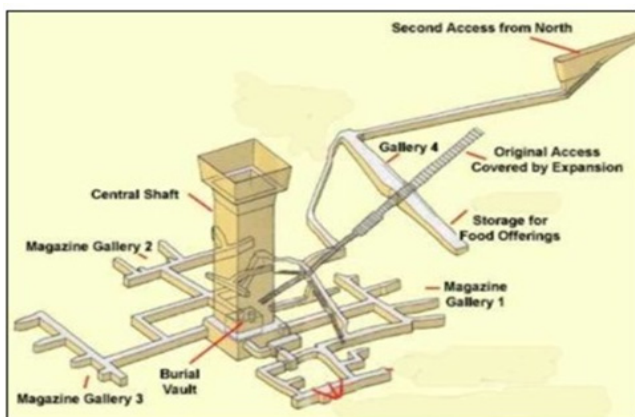
with a base covering about 15 ha., within an impenetrable 10.5 m. high stone wall forming an enclosure 750 x 600 m. (45 ha.), In turn, it is surrounded by a monumental trench (moat?) 40 m. wide. It was a 'sacred' area - forbidden, *haram* -because of *illahat* evil spirits (Figure 13).

Djoser was commemorated later in Egyptian history on the so-called *Famine Stele*, which records that he saved the country from famine (plague?) by rebuilding the temple of Khnum. The whole exercise and resulting complex was translated as the *Refreshment of the Gods*, probably better interpreted as 'repair of the spirits' (Barta, 2023). It was a clean-up operation.

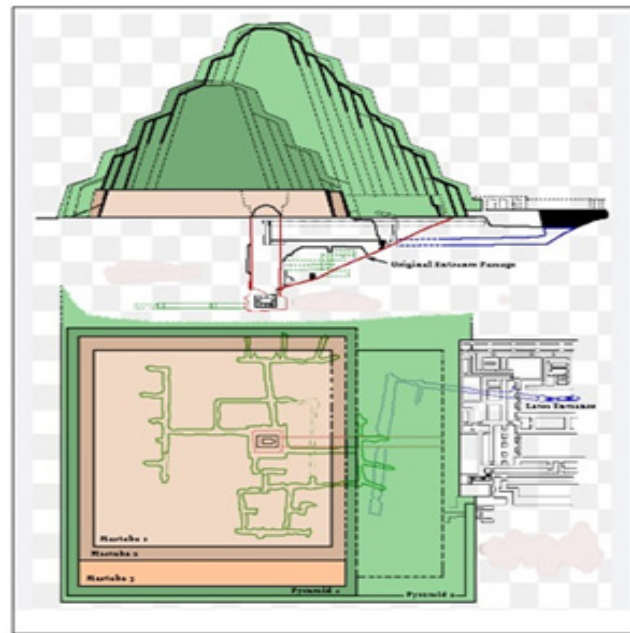
- The Step pyramid went through three to four stages of construction, illustrated below (Figures 14-16):
- The superstructure tiers were raised and widened to shield the lateral dimensions of the added underground storage galleries shown below:
- The initial design was an open-topped vertical shaft (ca 30m.) with a burial vault capped by massive granite beams and a 3.5-ton plug only 1 m. in diameter, later extended to include the extensive subterranean storage galleries discovered by French Egyptologist J. P. Lauer and reported by Quibell and Firth, (1935). About 40,000 storage pots were excavated and dispersed to museums worldwide.

As an aside, the pots were recorded to originally contain a kind of oil, mud, plaster, mortar, or ash (Takenouchi, 2021, pp. 177-190). At a nominal capacity of three to five liters each, the total quantity of contained material could have been in the order of 150-200 tons, which is unaccounted for.

Curiously, Lauer was unscathed and lived to the age of 99, but others at Saqqara were not so fortunate. J. Quibell died unexpectedly at 67 when still working, while his wife and co-worker (illustrator), A. Quibell, died at 65 of



**Figure 15.** The Step-Pyramid Stage-4 Underground Structure (Wikipedia Commons).



**Figure 16.** Final Footprint of the Step-Pyramid (pngwing.com).

leukemia. Pioneering Frenchman Mariette died at 59 of 'horrible haemorrhage', and his successor, Maspero, retired for ill health and collapsed and died of a nominal heart attack at 70. Champollion led a study of the texts inside the pyramids, after which six team members died early, unusual deaths (detailed earlier).

## DISCUSSION

This paper makes a series of observations of the strong radiation in ancient Egyptian mastaba tombs, the associated unusual deaths of Egyptologists, and possible sources of the unusual/unnatural radiation:

- Prior literature has recorded hazardous levels of radiation [as radon] in tombs of up to 4-5000 Bq/m<sup>3</sup> versus advisory 'safe' limits of 100-300 Bq/m<sup>3</sup>. Radon is a radioactive gas released from uranium decay, with a half-life of 3.8 days.
- Data from modern-era field Egyptologists and associates exposed to the excavation of tombs reveals high rates of death to cancer, nominal cardio-vascular failure, and other typical symptoms of haematopoietic cancer, corresponding to what is now recognised as radiation sickness. The rates of cancer and nominal heart failure alone are 3-4%, more than 10X the expected level for western Europeans.
- Prior publications reported highly unusual radiation (as radon) in underground tombs, up to an order of magnitude above expected levels, which was attributed to natural sources. However, the actual level of

background substrate radiation was not verified, and the extremely high, localised rates are not consistent with the accepted natural background (low in fine granite, nil, or rare in basalt and limestone). Radon gas is an intermediate product of uranium decay with a half-life of 3.8 days - high levels imply an adjacent source of uranium series decay.

- The possibility of abnormal, unnatural radiation raises consideration of alternative sources. Examination here reveals unexpected textual and physical evidence of uranium-based technology in ancient Egyptian funerary literature and in archaeological records of mastaba tombs.
- Egyptian funerary literature (*Pyramid Texts*, *Coffin Texts*, *Book of the Dead*) is known from about 2300-2100 BCE onward but recognised as derivative from some earlier source. It is viewed as a largely unintelligible, mystical guide to the afterlife. Here, a re-examination of standard translations reveals frequent, plain language descriptions of nuclear technology. Osiris was 'transformed into light', described presciently as a primeval substance, unformed matter, first born son of matter, light at its birth, formed of atoms. He had power and transformed by means of invisible emanations of 'efflux' from saffron cakes of 2-3-5 (yellowcake U-235) ... a 'magic power' which early translators rendered as a foul flux, efflux, incense, censuring, unguent, perfume, essence, spirits or fumigation. That terminology was rendered unwittingly in several English translations in the late 1800s when modern-era nuclear technology and language were still unknown.
- Archaeological records of mastaba tombs reveal structural and functional characteristics that are consistent with an original purpose for secure, long-term underground storage for nuclear waste. Texts record that the hated excrements of Osiris, the wastes that follow causing death, were buried in the underworld cavern [bunker]. That corresponds to the isolated, forbidden *per D'jet* underground vault of millions of years, storing stone pots labelled with the goose, the evil sparrow, and the venomous snake ... symbolizing alpha, beta, and gamma radiation. The thousands of pots excavated under the Step Pyramid in the 1960s contained potentially 150-200 tons of unidentified substances that are unaccounted for.
- Funerary literature also alludes to possible sources and processing of nuclear fuel. Texts make several references to *tchefau* food of the shining ones produced by digging the earth at *Sekhet Aaru* for a food offering that comes from southern Egypt. The 'magic food' was processed by diffusion in a 'wine press' or 'purification tent' or by a 'whirling dust devil' (centrifuge).

The efflux was made pure and stronger at Abydos; the milk was restored to its proper level in the regeneration place at Abydos. It entered the dust devil, and it emerged pure (*Coffin Texts*, Sp 471, 526, 594). Those allusions to processing are not pursued further here.

Prior published accounts confirm hazardous levels of radiation in ancient Egyptian tombs, which is shown to be linked to a pattern of radiation sickness in modern-era Egyptologists. However, the underlying source was not verified. Here, a sequence of characteristics suggests unnatural radiation in the mastaba tombs is consistent with the storage of nuclear waste; an unorthodox observation but with sufficient evidence to warrant more detailed comparative measurements, including analysis of the surrounding substrates.

## REFERENCES

- Arafat, A. A., El-Tahwaya, M.S., & Heba Samra. (2018). Comparison of radon concentrations in three types of Egyptian houses. *Journal of Nuclear and Radiation Physics*, 13(2), 147-156. <http://www.afaqscientific.com/jnrrp/v13n206.pdf>
- Bailleul-Lesuer, R. (2016). The exploitation of live avian resources in Pharaonic Egypt. PhD dissertation, University of Chicago. <https://RozennDissertation052516.pdf> (uchicago.edu)
- Barta, M. (2011). *Journey to the west: Old Kingdom tombs in ancient Egypt*. Charles University, [https://www.academia.edu/23316703/Journey\\_to\\_the\\_West\\_The\\_world\\_of\\_the\\_Old\\_Kingdom\\_tombs\\_in\\_Ancient\\_Egypt\\_Prague\\_2012](https://www.academia.edu/23316703/Journey_to_the_West_The_world_of_the_Old_Kingdom_tombs_in_Ancient_Egypt_Prague_2012)
- Barta, M. (2023). Tomb of architect-turned-god remains a mystery. American Research Centre in Egypt. <https://www.arce.org/resource/search-imhotep-tomb-architect-turned-god-remains-mystery>
- Bierbrier, M. (2012). *Who was who in Egyptology*, 4th revised edition. Egypt Exploration Society. [https://Bierbrier2012\\_WhoWasWho.pdf](https://Bierbrier2012_WhoWasWho.pdf) (kaowarsom.be)
- Bigu, J., Hussein, M., & Hussein, A. (2000). Radiation measurements in Egyptian pyramids and tombs. *Journal of Environmental Radioactivity*, 47(3), 245-252. [https://doi.org/10.1016/S0265-931X\(99\)00043-0](https://doi.org/10.1016/S0265-931X(99)00043-0)
- Binder, M., Roberts, C., Spencer, N., Antoine, D., & Cartwright, C. (2014). On the antiquity of cancer: Evidence for metastatic carcinoma in a young man from ancient Nubia (c. 1200BC). *PLoS One*, 9(3), Article e90924. <https://10.1371/journal.pone.0090924>
- Budge, E.A.W. (trans.). (1895). *The Egyptian book of the dead, Papyrus of Ani*. Dover edition, 1967.
- Budge, E.A.W. (trans.). (1901). *The Egyptian book of the*

- dead*. Thebean and Saite recensions. Chapt.CLXIII Saite recension, after Lepius. Full text of "Book Of The Dead Vol. 3" - Internet Archive
- Budge, E.A.W, (trans.). (1904). *The gods of the Egyptians*. Dover edition, 1969, Vol I.
- Chen, J. (2023). A review of radon exposure in non-uranium mines. *Health Physics*, 124(4), 244–256. <https://10.1097/HP.0000000000001661>
- Dreyer, G., & Kaiser, W. (1988). Tomb of King Scorpion at Abydos. <https://whyfiles.org/079writing/2.html>
- Dunn, C. (1998). *The Giza power plant*. Bear & Co.
- Edwards, I. E. S. (1961). *The pyramids of Egypt*, Penguin ed., 1993.
- Edwards, R. (1999, October 23). Pharaohs left behind a radioactive curse. *New Scientist*. <https://www.newscientist.com/article/mg16422092-700-pharaohs-left-behind-a-radioactive-curse/>
- Emery, W. (1961). *Archaic Egypt*, Penguin edition.
- Erman, A. (1923). *Ancient Egyptian poetry and prose, Lam-entations of Ipuwer*. Dover edition.
- Faltas, B. (2011). Cancer is an ancient disease: The case for better palaeoepidemiological and molecular studies. *Nature Reviews Cancer*, 23 Dec 2010, 11, 76. <https://10.1038/nrc2914-c1>
- Faulkner, R.O. (trans), (1969). *The ancient Egyptian pyramid texts*. OUP.
- Faulkner, R.O. (trans), (1972). *The ancient Egyptian book of the dead*. British Museum revised ed., 1985.
- Faulkner, R.O, (trans), (1973). *The ancient Egyptian coffin texts*. Aris & Phillips. [https://www.academia.edu/41483307/THE\\_ANCIENT\\_EGYPTIAN\\_COFFIN\\_TEXTS\\_3\\_Volume](https://www.academia.edu/41483307/THE_ANCIENT_EGYPTIAN_COFFIN_TEXTS_3_Volume).
- Frankfort, H. (1961). *Ancient Egyptian religion*. Harper & Row.
- Fritschy, W. (2018). The pr-ḥd and the early dynastic state. *Journal of Egyptian Archaeology*, 104(2), 161–76. <https://journals.sagepub.com/doi/full/10.1177/0307513319856853>
- Gardiner, A. (1927). Gardiner's sign list. [https://en.wikipedia.org/wiki/Gardiner%27s\\_sign\\_list](https://en.wikipedia.org/wiki/Gardiner%27s_sign_list)
- Hawass, Z. (2000). *Valley of the golden mummies*. American University Press in Cairo. ISBN 9774245857, 94-97.
- Hawass, Z. (2007). The discovery of the Osiris shaft at Giza. In Z. Hawass & J. Richards (Eds.), *The archaeology & art of ancient Egypt. Essays in Honor of David B. O'Connor, Vol. I* (pp. 379-397). Annales du Service des Antiquités de l'Égypte, Cahier 36. Supreme Council of Antiquities.
- Herzog, C. M., Dey, S., Hablas, A., El Hamzawy, H., Wilson, M. L., & Soliman, A. S. (2012). Geographic distribution of hematopoietic cancers in the Nile delta of Egypt. *Annals of Oncology*, 23(10), 2748–2755. <https://10.1093/annonc/mds079>
- Hurley, B. W. (2009). Natural radioactivity in the geologic environment. US National Nuclear Administration. [https://cemp.dri.edu/cemp/workshop2009/presentations/Hurley-Radioactivity\\_Geologic\\_Environ.pdf](https://cemp.dri.edu/cemp/workshop2009/presentations/Hurley-Radioactivity_Geologic_Environ.pdf)
- Ibrahim, A. S., Khaled, H. M., Mikhail, N. N., Baraka, H., & Kamel, H. (2014). Cancer incidence in Egypt: Results of the national population-based cancer registry program. *Journal of Cancer Epidemiology*, 2014, Article 437971. <https://pubmed.ncbi.nlm.nih.gov/25328522/>
- Jackson, B. (2014). Documentation and conservation of the funerary monument of Khasekhemwy at Abydos. American Research Centre in Egypt. <https://arce.org/project/http-localhost8811-node-869/>
- Lehner, M. (1997). *The complete pyramids*. Thames & Hudson.
- Linacre College, Oxford (2006) Oxford Expedition to Egypt: Scene-details Database. <https://doi.org/10.5284/1000009>
- Lovell, N. C., & Whyte, I. (1999). Patterns of dental enamel defects at ancient Mendes, Egypt. *American Journal of Physical Anthropology*, 110(1), 69-80. <https://pubmed.ncbi.nlm.nih.gov/10490469/>
- Lugli, A., Zlobec, I., & Singer, G. (2007). Napoleon Bonaparte's gastric cancer: A clinicopathologic approach to staging, pathogenesis, and etiology. *Nature Reviews Gastroenterology & Hepatology*, 4, 52–57. <https://doi.org/10.1038/ncpgasthep0684>
- Mant, M. (2014). Palaeopathology of human remains at ancient Mendes (Tell er-Rub'a), Egypt. *Bioarchaeology of the Near East*, 8(1), 1-27.
- Mole, D. M. (2016). Introduction to nuclear and radiological disasters. *Ciottono's disaster medicine*, (2nd ed.). <https://doi.org/10.1016/B978-0-323-28665-7.00105-9>
- Nelson, M. R. (2002). The mummy's curse: Historical cohort study. *British Medical Journal*, 325(7378), 1482–1484. <https://10.1136/bmj.325.7378.1482>
- Pahl, W. M. (1986). Tumours of bone and soft tissue in ancient Egypt. *International Journal of Anthropology*, 1, 267–275. <https://doi.org/10.1007/BF02442041>
- Petrie, W. M. F. (1883). *Pyramids and temples of Gizeh*. Histories & Mysteries of Man ed., 1990.
- Petrie, W. M. F. (1900). *The royal tombs of the 1st Dynasty*. Egypt Exploration Fund – cited by Frankfort, H. *Ancient Egyptian religion*, 92
- Petrie, W. M. F. (1904). *Abydos*. Memoir Egypt Exploration Fund, Part III, Ayrton et al.
- Quibell, J., & Firth, C. (1935). *Excavations at Saqqara: The step pyramid*. Impr. de l'Institut français d'archéologie orientale, Le Caire.

- Recht, L. (2020). Human sacrifice in the ancient Near East and Egypt. *The Ancient Near East Today*, 8(2), 168-180. <https://www.asor.org/anetoday/2020/02/human-sacrifice/>
- Reisner, G. (1927). Hatshepsut, mother of Cheops. *Boston Bulletin of Fine Arts*, Suppl. Vol 1.
- Reisner, G., & Fisher, C.S. (1913). Preliminary report on the work of the Harvard-Boston Expedition in 1911-13. [http://www.gizapyramids.org/pdf\\_library/reisner-fisher\\_asae\\_13\\_1913.pdf](http://www.gizapyramids.org/pdf_library/reisner-fisher_asae_13_1913.pdf)
- Richards, J. (2002). University of Michigan Abydos Field Report. <https://lsa.umich.edu/kelsey/research/current-field-projects/abydos--egypt.html>
- Ritner, R. (2000). Innovations and adaptations in ancient Egyptian medicine. *Journal of Near Eastern Studies*, 59(2), 107-117. <https://doi.org/10.1086/468799>
- Salama, E., Ehab, M., & Ruhm, W. (2018). Radon and thoron concentrations inside ancient tombs at Saqqara region: Time resolved and seasonal variation measurements. *Nuclear Engineering & Technology*, 50(6), 950-956. <https://doi.org/10.1016/j.net.2018.03.017>
- Sarry El-Din M.A. (2002). Degenerative spinal arthritis in ancient Egyptians from the Old Kingdom. *Egyptian Journal of Anatomy*, 25, 179-193.
- Seibold, P., Auvinen, A., Averbeck, D., Bourguignon, M., Hartikainen, J. et al., (2020). Clinical and epidemiological observations on individual radiation sensitivity and susceptibility, *International Journal of Radiation Biology*, 96(3), 324-339. <https://doi.org/10.1080/09553002.2019.1665209>
- Takenouchi, K. (2021). Mortuary consumption and the social function of stone vessels in early Dynastic Egypt. *Journal Egyptian Archaeology*, 107 (1-2), 177-190. <https://journals.sagepub.com/doi/full/10.1177/03075133211050650>
- Temple, R. (2010). *Egyptian dawn*. Arrow.
- Unger, J. (2020). Ancient Egyptian prescriptions for the back and abdomen and their Mesopotamian and Mediterranean counterparts. In U. Steinert (Ed.), *Systems of classification in premodern medical cultures: Sickness, health and local epistemologies*. (pp. 123-138). Routledge. <https://doi.org/10.4324/9780203703045-8>
- University of Granada, (2017, December 14). CT scans of Egyptian mummies reveal oldest known cases of breast cancer and multiple myeloma. *ScienceDaily*. <https://www.sciencedaily.com/releases/2017/12/171214101215.htm>
- Vyse, H. (1840). *Operations carried out at the pyramids of Giza in 1837*, (Vol. II) Fraser.
- West, G. (2019). *The Tekenu and ancient Egyptian funerary ritual*. ArchaeoPress Publishing. PhD dissertation. <https://9781789691825-sample.pdf> (archaeopress.com)
- World Cancer Research Fund (WCRF), (2021). Global cancer data by country. <https://www.wcrf.org/cancer-trends/global-cancer-data-by-country/>
- Zeinelabdein, M A. (2018). The pr-Djt in the Old Kingdom. *Minia JI. of Tourism and Hospitality Research*, 2, 179-198. [https://www.academia.edu/53030794/The\\_pr-Dt\\_in\\_the\\_Old\\_Kingdom](https://www.academia.edu/53030794/The_pr-Dt_in_the_Old_Kingdom).
- Zink, A. R., Nerlich, A. G., Hagedorn, H. G., & Szeimies, U. (2000). Anthropological and palaeopathological analysis of the human remains from three "Tombs of the Nobles" of the Necropolis of Thebes-west, Upper Egypt. *Anthropologischer Anzeiger*, 58, 321-343. <https://doi.org/10.1127/anthranz/58/2000/321>
- Zink, A., Rohrbach, H., Szeimies, U., Hagedorn, H., Haas, C., Weyss, C., Bachmeier, B., & Nerlich, A. (1999). Malignant tumours in an ancient Egyptian population. *Anticancer Research*, 19, 4273-4277. <https://pubmed.ncbi.nlm.nih.gov/10628386/>

## APPENDIX

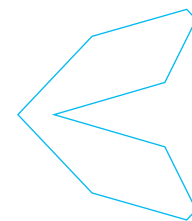
	BIRTH/ DEATH	AGE OF DEMISE	CASUE OF DEMISE	NOTES
<b>CANCER</b>				
Adams, B	1945-2002	57	Cancer	Excav at Hierakonpolis and Abydos; curator Petrie Mus at UCL. Suddenly of cancer
Edwards, A	1831-1892	61	Cancer	Many years in Egypt. Founded Egypt Exploration Soc.
Fattovich, R	1845-1918	73	Cancer	Excav widely in Egypt & Ethiopia.
Goedicke, H	1927-2015	88	Cancer	Excav at Abu Simel and at Giza. Academic at John Hopkins. Of cancer
Grdseloff, B	1915-1950	35	Cancer	Worked with DAI in Cairo (and Abydos?)
Hart, G	1945-2021	75	Cancer	Studied at UCL, lifetime lecturer at Brit Museum
Hayter, A	1863-1927	64	Cancer	Excav with Petrie at Hawass, Quibell at Saqqara
Hecker, H	1935-2002	67	Cancer	Excav at Memphis, Giza and Amarna.
Hoffman, M	1944-1990	46	Cancer	Excav at Hierakonpolis.
Keller, C	1945-2008	63	Cancer	Curator various museums. Studied murals at Thebes. Pancreatic cancer
Lepius, K	1810-1884	74	Cancer	Fell ill suddenly after excavating at Valley of the Kings. Died of bowel cancer
Napoleon B	1769-1821	51	Cancer	Overnight in Grt Pyr. Devel nausea, abdominal pain, blood clots, gastric ulcers; stomach cancer
Spiegelberg	1870-1930	60	Cancer	Academic, philologist, collector in Egypt 1895-99. Died unexpectedly of bladder cancer
Weigall, A	1880-1934	54	Cancer	Excav with Petrie at Abydos, later widely at Thebes. Died prematurely of cancer
Carter, H	1874-1939	65	Hodgkin's	Explorer and collector, famous for discovering Tut's tomb. Hodgkin's lymphoma
Quibell, A	1862-1927	65	Leukemia	Asst Petrie at Thebes and Saqqara, later illustrator with J Quibell at Saqqara
Ritner, R	1953-2021	68	Leukemia	Career examining 'magic' Egyptian artifacts.
<b>HEART/ STROKE</b>				
Abel, H	1883-1927	44	Heart att	Early excav of Khafre pyr at Giza.
Baer, K	1930-1987	56	Heart att	Excav with Fakhry at Giza and Saqqara. Later Prof at Chicago
Benson, M	1865-1916	51	Heart att	Excavated tombs at Thebes. Suffered ill health, died of heart failure
Champollion	1790-1832	41	Apoplexy	Noted for translation of hieroglyphs. With Rosellini, studied Pyr Txts at Saqqara
Chester, G	1830-1892	62	Heart att	Collected 'unofficially' for Brit Mus, Bodleian & Ashmolean
Demel, H	1886-1951	65	Heart att	Excav necropolis at Giza, member of DAI. Curator Vienna Mus
Emery, W	1903-1971	68	Stroke ?	Excavated many tombs, incl Abydos & Saqqara. Collapsed in pyramid, died in 2 days
Fakhry, A	1905-1973	72	Heart att	Excavated at Siwa and Dashur. Died suddenly while travelling
Glanville, S	1900-1956	56	Heart att	British academic
Griffith, F L	1862-1934	72	Heart att	Philologist. Trained under Petrie and Naville in Egypt. Excav in Nubia and Amarna
Hogarth, D	1862-1927	65	Heart att	Excav in Mid East and Egypt. Curator at Ashmolean Mus. Sudden heart attack
Lucas, A	1867-1945	78	Heart att	Worked on excavation of Tut's tomb, examined artifacts. Died suddenly visiting Luxor
Lythgoe, A	1868-1934	65	Stroke?	Excav. with Reisner; at opening of Tut's tomb. Suff 'mysterious illness', cerebral arteriosclerosis ?
Makrahmallah	1903-1949	46	Heart att	Asst Dir at Saqqara 1931-37; later at Luxor. Died of heart ailment
Mallackh, el K	1918-1987	69	Heart att	Excav at Giza; discovered Khufu's boat
Maspero, G	1846-1916	70	Heart?	Pioneering excavations at Saqqara. Retired for health, died suddenly at an academic lecture
Perring, J S	1813-1869	56	Apoplexy	Worked with Vyse at Giza, later at Saqqara and Abusir.
Petrie, Hilda	1871-1957	86	Stroke	With Wm Petrie at Giza and widely elsewhere, esp as copyist and illustrator
Vandekerckhove	1959-1989	30	Heart att	Participated in excav at El Kab, 1981-87
<b>'ILL HEALTH'</b>				
Aksamit, J	1958-2008	50	Illness	Excav at Dier el Bahari. Suff same 'illness' as colleague Lipinska
Alpini, P	1553-1616	63	Kidney infection	Explored inside the Great Pyr at Giza.

Ballerini, F	1877-1910	33	Fell ill	With Schiaparelli at Thebes, Giza, Heliopolis & Dier el Medina. Suddenly fell ill
Bates, O	1883-1918	35	Illness	Excav in Nubia 1908-10. Took ill and died in army camp
Belzoni, G	1793-1823	45	Dysentery?	Early tomb explorer and collector of artifacts. Died suddenly, attrib to dysentery
Bethell, R	1883-1929	46	Asphyxia	Asst excav of Tut's tomb. Collector of small antiquities. Susp 'suffocation' in Ldn club
Bidoli, D	1934-1973	39	Illness	With various German excavations. Died of 'an illness'
Bilharz, T	1825-1862	37	Asthma/ typhus?	Noted discoverer of bilharzia. Also explored tombs. Sudden death to asthma or typhus?
Blackman, A	1883-1956	73	Fever	Excav with Reisner in Nubia. Suffered typhoid fever
Bouriant, U	1849-1903	54	Ill health	Assoc of Maspero, excavated at Thebes. Dir IFAO until health failed
Breasted, J	1865-1935	70	Strep / malaria	Many years in Egypt, at opening of Tut's tomb. Died of strep infection or malaria
Burton, H	1879-1940	60	Diabetes	10 yrs photographer at excavation of Tut's tomb; health declined from 1937
Callender, J	1940-1987	47	Ill health	1986 took position with Amer Uni Cairo, but resigned due to ill health
Carnarvon	1867-1923	56	Blood poisoning	Died soon after opening Tut's tomb. Erysipelas and strep blood poisoning
Currelly, T	1876-1957	81	Illness	With Petrie in Egypt. Avid collector, curator at Toronto Mus. Fell ill, died in hospital
Denon, V	1747-1825	78	Pneumonia?	With Napoleon in Egypt. 1st curator at Louvre. Caught cold and died in 2 days
Deveria, T	1831-1871	40	Ill health	Excav with Mariette, asst curator at Louvre; suffered ill health
Drovetti, B	1776-1852	76	Insanity?	Prolific [illicit] collector in Egypt, incl. Turin King List. Died in lunatic asylum
Ebers, G	1837-1898	61	Ill health	Collected at Thebes, noted for Ebers Papyrus. Later academic. Retired for ill health
Firth, C	1878-1931	53	Pneumonia	Excavated widely with Petrie and later at Saqqara. Died on holiday, of pneumonia
Firth, W	1872-1937	75	Illness	Copyist for Petrie at Giza, Abydos, Saqqara. Died after long illness
Frediani, D	1783-1823	40	Insanity?	Associate of Belzoni and Drovetti [collectors]. Died insane
Gould, J G	1864-1923	59	Pneumonia	Present at opening of Tut's tomb, contracted fever and died of pneumonia
Grenfell, B	1869-1926	57	Ill health	Excav with Petrie, later explored widely for papyrii. Suffered ill health
Hall, H	1873-1930	57	Pneumonia	Asst curator at Brit Mus; excav for EES at Abydos. Caught cold and died
Jonckheere	1903-1956	53	Prematurely	Made study of mummies in Egypt 1939-42
Lansing, G	1825-1892	67	Ill health	Lived in Egypt from 1856; collected papyrii. Ill health from 1886
Legrain, G	1865-1917	52	Pneumonia	Asst de Morgan at Karnak & Luxor. Illustd many sites. Sudden illness, died in few days
Leider, R	1798-1865	67	Cholera	Missionary in Egypt 1825-62; collected antiqs
Lenormant	1802-1859	57	Fever	With Franco-Tuscan Expedition 1928-29. Died of fever while travelling
L'Hote, N	1804-1842	38	Frail health	With Champollion's study at Saqqara 1928-29, and elsewhere
Lipinska, J	1932-2009	77	Illness	Excav widely [at late sites?]. Died of unspecified 'illness'
Mace, A C	1874-1928	53	Poison/pneu	Worked with Petrie and Reisner, and at Tut's tomb. Retired for ill health
MacKay, H	1880-1943	63	Nat causes'	Excavated with Petrie at Thebes 1907-1912. Died of natural causes
Mariette, A	1821-1881	59	Haemorrhage	Pioneering excav at Saqqara. Died in Cairo of haemorrhage / possible diabetes
Misset, E	1775-1820	45	Ill health	Brit Consul 1803-16, resigned for ill health. Assoc of Athanasi
Moller, G	1876-1921	45	Malaria	Excav at Abusir and Dier el Medina, 1902-12. Died suddenly, susp malaria
Najib, A	1847-1910	63	Ill health	With EAS but retired for ill health
O'Connor, D	1938-2022	84	Parkinson's	Excavated for long period at Abydos. Died of Parkinson's
Osman E	1791-1835	44	Dysentery	Resident Egypt, asst Salt, Burchardt, Hay
Pendlebury	1904-1941	37	Haemorrhage	Excav at Amarna. Possibly shot?
Perry, W J	1887-1949	62	Parkinson's	At UCL 1923-39, retired early due to Parkinson's
Petrie, Wm	1853-1942	89	Malaria?	Long career of excavation, esp Abydos and Giza. Died in hospital in Jerusalem
Reid, A D	1871-1924	53	Radiation?	Radiographer, X-rayed Tut's mummy. Already in ill health, died in 3 Days
Reisner, G	1867-1942	75	Poisoning?	Excav mastabas at Giza. Collapsed inside the Grt Pyr, died later of 'poisoning'?
Rhind, A	1833-1863	29	Pulmonary dis.	Excav and collected at Luxor and Giza. Died of pulmonary disease
Ricci, A	1795-1834	39	Poison?	5yrs in Egypt exploring, illustrating, collecting. With Champollion 1928-29
Rosellini, I	1800-1843	43	Malaria?	Assoc of Belzoni. With Champollion at Saqqara. Death attrib to malaria

Seetzen, U	1767-1811	44	Mysterious	Explored Giza, Saqqara, Heliopolis. Large collection. Died mysteriously
Settgast, J	1932-2004	72	Ill health	Excav briefly at Thebes 1966. Retired 1985 for ill health
Sicard, C	1677-1726	49	Plague	Missionary in Cairo. Explored widely
Smolenski, T	1884-1909	25	Premature	Studied with Maspero. Several excavations of tombs. Died prematurely
Weidenbach	1818-1882	64	Ill health	Artist with Lepius excavations. Retired for ill health
Wilkinson, J	1797-1875	78	Ill health	Explored 1821-33, suffered 'ill health'; again in 1855-56 suffered 'sunstroke'
Winlock, H	1884-1950	65	Ill health	Excav widely 1906-31; Dir of Met Mus of Art.; extensive 'finds'; suffered ill health

**'SUDDEN'**

Akerbald, J D	1763-1819	56	Sudden	Early translator of demotic script. Collected antiquities. Died suddenly in Rome
Anderson, H	1799-1875	76	Sudden	Collected mummies and antiqs, now in Brooklyn Mus. Sudden illness in Lahore
Anderson, R	1927-2015	88	Sudden	Excav at Saqqara and Nubia. Died suddenly after short illness
Andrzejewski	1923-1961	38	Sudden	Excav widely in the Delta with Polish Arch Inst. Died unexpectedly when still working
Borchardt, L	1863-1938	74	Sudden	Excavated widely in Egypt, discovered bust of Nefertiti. Died suddenly while travelling
Branicki, A	1821-1877	56	Sudden	Collected antiquities from private expeditions. Died suddenly in Nice
Brunton, G	1878-1948	70	Unexpected	Excav with Petrie. Later curator at Cairo Mus
Cerny, J	1898-1970	72	Unexpected	Excav at Dier el Medina 1925-70. Unexpectedly within few days of return from Egypt
De Buck, A	1892-1959	67	Unexpected	Prof at Leiden. Noted translator Coffin Texts. 5 years in Egypt. Died unexpectedly
Derry, D E	1874-1961	86	Sudden	Early curator at UCL. Later Prof Egyptian Mus, Cairo. Examined mummies
Donati, V	1717-1762	45	Unexpected	Collected antiquities for Turin Mus; died unexpectedly on ship to India
Dreyer, G	1943-2019	76	Unexpected	Extensive excavations at Abydos
Engelbach, R	1888-1946	57	Sudden	Longtime curator at Cairo Mus. Asstd Petrie and Carter. Suddenly in Cairo hospital
Garstang, J	1876-1956	80	Sudden	Excavated with Petrie at Abydos. Died suddenly on holiday
Hussein, R A	1971-2022	50	Sudden	Worked for 7 years at Giza and Saqqara. Died of sudden severe illness
Jones, H	1877-1911	34	Sudden	Excav & illustrator. With Garstang at Hierakonpolis & Abydos. Suddenly at Thebes
Kaiser, W	1926-2013	87	Unexpected	Extensive excavations at Abydos. Died unexpectedly
Krall, J	1857-1905	48	Unexpected	Coptic scholar. Died 'unexpectedly'
Peet, E	1882-1934	52	Sudden	Excav at Abydos with Naville, and independently. Died suddenly
Quibell, J E	1867-1935	67	Unexpected	Identified & excav pre-dyn sites. Notable for Narmer palette. Died when still working
Ransom Wm	1872-1952	79	Sudden	Excav at Luxor; Cairo Mus; asst curator at the Met. Sudden illness, died in 1 week
Segato, G	1792-1836	44	Sudden	Studied tombs and mummies at Saqqara. Died suddenly, prematurely
Sibeud, J	1814-1877	63	Sudden	In Egypt 1841-42, collected antiqs
Tassie, G	1960-2019	59	Sudden	Explored in Egypt; curator at UCL & Cairo Mus. Suddenly took ill and died in Cairo
Tefnin, R	1945-2006	61	Unexpected	Excav at Tanis and tombs at Luxor. Died unexpectedly on holiday in India
Werbrouck	1889-1959	70	Sudden	Worked at El Kab 1936-38. Suffered fatigue and died suddenly while on holiday
Wiedemann	1856-1936	80	Sudden	Prof of Egyptology, Bonn. Died suddenly
Zaba, Z	1917-1971	54	Sudden	Long career of excavation at Abusir; died suddenly in Prague



**RESEARCH  
ARTICLE**

# After-Death Communications (ADCs) from Non-Human Animals: Parallels with Human ADCs

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## HIGHLIGHTS

Reports of after-death communications from non-human animals closely resemble those from humans, suggesting common underpinnings to these events.

## ABSTRACT

In an earlier study, Rupert Sheldrake, Pam Smart, and Michael Nahm reviewed accounts of end-of-life experiences (ELEs) involving non-human animals. They showed animal ELEs to be similar to human ELEs, suggesting common underlying processes. Here, we consider apparent after-death communications (ADCs) from non-human animals and compare them to accounts of ADCs from humans. We collected 442 accounts of animal ADCs from our own appeals and from reports in the literature. We found a close resemblance between ADCs from animals and from humans in the types of experience—dream visitations, a sense of presence, visual, auditory, tactile, and olfactory apparitions, and psychokinetic effects. As with human ADCs, the great majority of animal ADCs were reported to have occurred in the first hours or days after death, with a dramatic falling off over time. Moreover, our data show that people grieve their pets in much the same fashion as they grieve their human loved ones, suggesting that human bereavement studies would do well to take into account the animal data to which we draw attention. Doing so may help clarify issues regarding the fundamental nature of the experiences—determining whether they are best regarded as internal hallucinations, as living-agent-psi-mediated subjective or objective phenomena, or as actual contacts with the deceased—which in turn carries implications not only for academic studies of bereavement but for clinical practice with the bereaved.

## KEYWORDS

After-death communication, animals, bereavement, continuing bonds, phenomenology

## INTRODUCTION

Sheldrake et al., (2023) reviewed accounts of end-of-life experiences (ELEs) involving non-human animals. They showed animal<sup>1</sup> ELEs are similar to human ELEs, suggesting common underlying processes. Here, we consider apparent after-death communications (ADCs)<sup>2</sup> from animals. Generally, these were animals that lived with

people as pets and companions—mainly dogs and cats, but also horses, other mammals, birds, a goldfish, and a house spider.

Our database comprises four distinct samples: accounts reported to Sheldrake and Pam Smart between 1996 and 2009, predominantly in response to appeals in 2003 and 2004; accounts collected by James Matlock and Bethany Hilton from Facebook groups between June 2020





and the first months of 2023; accounts culled from the scholarly and popular literature published between the 1880s and 2020s; and accounts from stories and reader responses in the London *Daily Mail* online edition in 2016.

We defined an ADC as apparent contact with an animal after its death without further specifying the form of that contact. We excluded animals in place-centered hauntings, in which there was no connection between the deceased animals and living human percipients. We also excluded mediumistic contacts with deceased animals, borderline accounts involving symbolic signs and synchronicities, experiences that seemed to us equally well or better interpreted as psi from living agents, and photographic anomalies. Our four samples combined contain a total of 442 accounts we judged to be apparent after-death communications from animals.

The accounts<sup>3</sup> and are largely anecdotal, although some include information from follow-ups through Facebook instant messaging or email. As our literature sample demonstrates, animal ADCs have been widely reported for some time, although as with Sheldrake et al.'s (2023) ELE study, the present study is the first to focus on this material in an academic journal. It is also the largest study of these experiences to date. Consistent with animal ELEs, we show that animal ADCs are, in many respects, remarkably similar to human ADCs in their phenomenology, again suggesting common processes underlying the experiences. Although we recognize the limitations of our reliance on anecdotal accounts and the informal and heterogeneous strategies by which they were collected, we anticipate that the patterns we have identified will be confirmed and extended in more formal surveys. After describing our methods and outlining our results, we provide illustrative examples of each account type, comparing them to human ADC types. In discussion, we treat the animal accounts within the framework of human bereavement studies.

## METHOD

Matlock and Hilton began their informal survey of Facebook groups in response to Sheldrake et al. (2023, in draft) without knowing that Sheldrake and Smart already had a substantial sample of animal ADCs. When we realized that we had two samples of the same occurrence, we decided to compare them, later adding samples of previously published accounts (one in print, the other on the web). The four samples were collected over different time periods, utilizing different protocols, and we wanted to see how similar they were. The more similarities across the samples, the more robust our conclusions could be, we reasoned.

Our Sheldrake/Smart (S/S) sample is drawn from the same large dataset from which their animal ELE accounts were taken. The majority of accounts came in response to Sheldrake's requests for animal ADCs in the London *Daily Mirror* in 2003 and 2004. Others were reported in response to articles in other newspapers, pieces in his newsletter or on his website, or his books *Dogs that Know When Their Owners are Coming Home* (1999) and *Seven Experiments That Could Change the World* (2002) between 1996 and 2009.

Our Matlock/Hilton (M/H) sample derives in the main from four Facebook groups in which Matlock and Hilton solicited animal ADC accounts between December 2022 and July 2023.<sup>4</sup> They also searched the same groups for earlier relevant postings, adding a few accounts that go back as far as June 2020. Matlock and Hilton engaged with respondents on the group pages and, in some instances, followed up accounts in instant messaging or email to obtain additional information. They did not attempt to investigate accounts through in-depth interviews, nor did they request supporting documentation, although sometimes this was volunteered.

Our Literature (Lit) sample consists of ADC accounts that have appeared in books and periodicals. Some of our sources (Bayless, 1970; Bozzano, 1950; Gaddis & Gaddis, 1970; O'Donnell, 1912/2012) compiled narratives from early psychical research publications, whereas others contained previously unpublished accounts (see Database Sources, following paper References list). A few of these accounts were investigated to some degree, but the majority are anecdotal only. This is true especially of more recent accounts in books, often self-published, intended for the general reader. On the whole, we believe our coverage of both older and newer accounts of animal ADCs is reasonably comprehensive, although we have not sought to make it definitive. With the exception of a few French cases in Bozzano (1950), all accounts were drawn ultimately from English-language sources.<sup>5</sup>

Our *Daily Mail* (DM) sample contains accounts published in an article (*Mail Online* Editor, 2016) promoting a book by Bel Mooney (2016a), along with comments from readers,<sup>6</sup> and two additional accounts contributed in comments following a subsequent article by Mooney (2016b). Mooney's own account is taken from her book and is included in our Lit sample.

From prior acquaintance with the animal ADC literature and accounts on Facebook, we had the impression that animal ADCs conformed to the same types as human ADCs (a sense of presence; dream visitations; visual, auditory, tactile, and olfactory apparitions<sup>7</sup> psychokinetic effects) and we coded the animal accounts accordingly. Several respondents contributed accounts of more than

**Table 1.** Animals Involved in ADCs (Combined Sample)

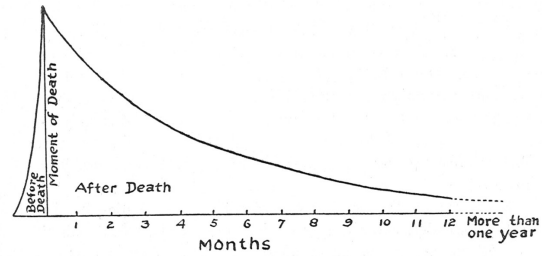
Animal	N
Dog	220
Cat	195
Horse	5
Llama	1
Pig	1
Ferret	1
Guinea pig	1
Hamster	3
Rabbit	3
Rat	2
Mouse	1
Opossum	1
Bird	5
Fish	1
Spider	1
Unclear	1
<i>Total</i>	<i>442</i>

one animal. Many accounts included more than one type of ADC, similar to human ADC reports (Streit-Horn, 2011; Woollacott et al., 2022). We assigned each animal a unique account record, with the records recording all ADC types pertaining to that animal. We grouped ADC phenomena that did not conform to one of the seven major types in an Other category. A few submitted accounts were, in one way or another, ambiguous or questionable as true after-death communications. We classified these as Borderline/Questionable and excluded them from our analysis.<sup>8</sup>

Matlock and Hilton coded accounts in each of the four samples, deciding on the assignment of type of ADC and other variables (e.g., country, animal, time elapsed between death and ADC). Although they did not code independently, they checked each other’s work and discussed and resolved all coding disagreements. Codes were later reviewed by Sheldrake and Nahm, and disagreements were again discussed and resolved so that we had a four-way agreement on coding decisions.

**OVERVIEW OF RESULTS**

Because we collected accounts in an open-ended way and coded them rather than using a questionnaire, our data for many variables is incomplete. Follow-up questions compensated for this incompleteness to an extent, although our questions were aimed at clarifying ambiguities and obtaining more comprehensive descriptions rather than adding data on specific variables. The obvious disadvantage to this approach is the incompleteness of the data, but there is an advantage also, in that we avoided leading questions, and the responses we received and coded were, by and large, spontaneous.



**Figure 1.** Incidence of apparitions of dying and deceased persons (from Flammarion, 1923).

Similar to reports of human ADCs, the overwhelming majority of the respondents in all five samples were women, but this should not be interpreted to mean that experiencers of animal ADCs were predominantly women. Woollacott et al. (2023, p. 426) note that although their questionnaire respondents were predominantly female, other studies have shown no sex difference in those who experience ADCs. In our collection, husbands, sons, and other men frequently figure in the accounts as co-percipients of the phenomena in question.

Although we coded for country, many of the accounts we collected did not specify the place respondents lived, so we refrained from reporting this statistically. However, it is our impression that the bulk of our accounts came from the United Kingdom and the United States, with some from Canada, Australia, and countries in Europe and Asia. One account is identified as coming from Argentina.

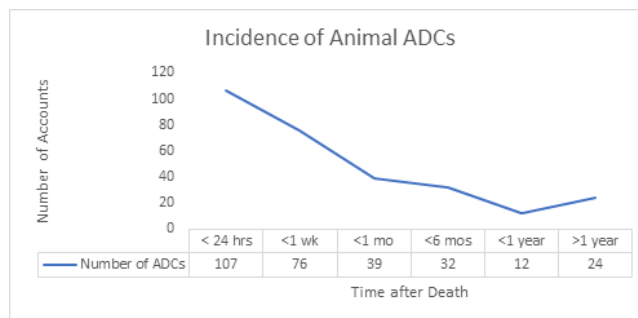
A list of the animals represented in our collection is shown in Table 1. It should be noted that this list is based on our combined sample and tallies accounts, which we located in the literature and on the web, along with accounts reported to us. Unsurprisingly, since dogs and cats are the most common pets, they are disproportionately represented in our dataset. Significantly, however, we collected accounts involving horses, a llama, a mouse, birds, and a fish. Our Lit and Mail samples contributed several mammals (rabbits, hamsters, guinea pigs, rats, a pig, a ferret, an opossum) and a spider that did not appear in the responses to our own appeals.

Human ADC studies beginning with the classic *Phantasms of the Living* (Gurney et al., 1886) have consistently found that the majority of experiences occur near death, with a dramatic falling off over time. Haraldsson (2012, p. 232) found that in surveys in Iceland, 14% of respondents reported apparitional experiences within 24 hours of a death.

In the third volume of his *Death and Its Mystery* trilogy, which analyzed thousands of European human accounts and cases, Flammarion (1923, p. 299) presented

a graph that is reproduced as Figure 1.<sup>9</sup> Researchers concerned with animal ADCs have observed a similar pattern: the great majority of contacts are reported in the first days after death, which is a dramatic decline in the number of experiences over time (Warren, 2009, p. 121). The majority of our accounts do not specify a precise time from death to ADC, so we coded in periods of ≤ 24 hours, ≤ 1 week, ≤ 1 month, ≤ 6 months, ≤ 12 months, and >12 months. The results from the 291 accounts for which we have pertinent data are presented in Figure 2.

Our data show the same trend as with human ADCs, with the majority of experiences coming in the first hours or days after death. In fact, 37% of the accounts we collected were of events occurring initially within the first 24 hours, and 63% occurred initially within the first week. Some (30, or 6.3%) were coincident with the death itself. However, it is important to appreciate that Figure 2 records the date at which experiences began and does not capture their duration. ADC experiences were recurrent in 134 accounts (30.3%). When they recurred, it was usually not in exactly the same way, although this reportedly did happen on occasion. Often, various visitations appeared for days or weeks before they ceased, not to resume, whereas in other instances, they persisted for a period of



**Figure 2.** Incidence of animal ADCs over time.

time, ceased, and then reappeared at some point (often years) later. In some accounts, the experiences were ongoing at the time of the report.

Many records (103/442, 23.3%) contain reports of collective percipience, either on the same occasion or on different occasions. In 30 instances (6.8%), a living animal reacted to the perceived presence of a deceased animal. Sometimes animals reacted (e.g., by seeming to follow with their eyes, vocalizing, or otherwise responding) as if they saw something no human could see, but in the majority of animal reactions (26/30, 87%), the apparition was perceived simultaneously, or on separate occasions,

**Table 2.** ADCs from Non-Human Animals in Five Samples.

ADC Type	S/S Sample (n = 120)	M/H Sample (n = 82)	Literature Sample (n = 165)	Daily Mail Sample (n = 77)	Total Sample (N = 442)
Visual apparition	45	26	82	28	181 (25.3%)
Tactile apparition	50	28	58	32	168 (23.5%)
Auditory apparition	40	17	76	23	156 (21.8%)
Dream visitation	12	30	28	10	80 (11.2%)
Sense of presence	18	7	17	6	48 (6.7%)
Psychokinetic effect	4	5	26	6	41 (5.7%)
Other ADC phenomenon	9	4	8	1	22 (3.0%)
Olfactory apparition	8	1	8	3	20 (2.8%)
<b>Total ADC phenomena</b>	<b>186</b>	<b>118</b>	<b>303</b>	<b>109</b>	<b>716 (100%)</b>

**Subtypes of Other ADC Phenomenon (N = 24)**

Other Phenomena	S/S Sample	M/H Sample	Literature Sample	Daily Mail Sample	Total Sample
Telepathic message	4	3	5	0	12 (54.6%)
Electric charge felt	2	0	0	0	3 (13.6%)
Influence on living	1	0	1	1	2 (9.1%)
Sign/ synchronicity	2	1	2	0	5 (22.7%)
<b>Total Other subtypes</b>	<b>9</b>	<b>4</b>	<b>8</b>	<b>1</b>	<b>22 (100%)</b>

**Borderline/Questionable ADC Phenomena (N = 24)**

B/Q Subtype	S/S Sample	M/H Sample	Literature Sample	Daily Mail Sample	Total Sample
Sign, synchronicity	2	2	--	0	4 (17.4%)
Living agent psi	12	2	2	0	16 (69.5%)
Photographic anomaly	0	2	1	0	3 (15.0%)
<b>Total B/Q</b>	<b>14</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>23 (100%)</b>

**Note:** n counts are number of records in each sample. Each record represents a single animal. The totals of ADC counts exceed n counts because many records include multiple types of ADC.

by one or more human. Animals have been reported to have reacted to the apparitions of humans as well, sometimes as co-percipients (Nahm, 2016).

Respondents sometimes reported that they were in deep grief for their departed pets at the time they saw their apparitions or felt their presence. A state of grief coincident with the phenomena was mentioned in 73 accounts (16.5%). Negative reactions, such as a woman who said she would rather her cat not come back, were reported only in two accounts.<sup>10</sup>

The top section of Table 2 shows the numbers of ADCs of different types in each of our samples in order of prevalence in our Combined sample. By and large, the distribution of types is consistent across the five samples, although the proportions of visual and tactile apparitions are reversed in the Lit sample versus the others. The variations across our samples may be attributable to sampling error or (in the Lit sample) selection bias. There is considerably more consistency across our samples than across studies of human ADCs, perhaps an artifact of the different methods, questions, and sample sizes of the latter (Woollacott et al., 2022, p. 428), which was evened out by coding all accounts we collected.

Accounts assigned to the Borderline/Questionable (B/Q) category, and therefore not included in the present analysis, comprise a small minority (only about 5.2%) of the total number of accounts (ADC + B/Q) in our collection.

## EXAMPLE ACCOUNTS

Examples of the types of animal ADC in our S/S and M/H samples appear below, with citations to the corresponding record number in our database. We preface the narratives in each category with reference to human ADC analogs. In editing the narratives for publication, we have retained differences between American and British vocabulary, spelling, and punctuation.

### Visual Apparitions

Streit-Horn (2011) concluded that visual apparitions were one of the three most common types of human ADC. Indeed, almost half (46.4%) of the respondents to the survey of Elsaesser and colleagues (Elsaesser et al., 2021; Woollacott et al., 2022) reported having seen apparitions of deceased loved ones. In his literature review of animal accounts, Edward Anderson (2021, p. 167) says that visual apparitions were “by far” the most common form of ADC. Although we cannot say that visual apparitions are “by far” the most common type of ADC in our collection, they are *the* most common type, representing about a quarter (25.3%) of all ADCs. Visual apparitions frequently co-

cur with ADCs of other types, and they may be collectively perceived. Often, they are recurrent. The following narratives are drawn from our collection.

When our beloved pit bull passed away from kidney failure, we were so heartbroken. We cried like babies, we loved him so much. His name was Judge. Judge liked to go to bed, in our bed, by 9:00. If we went to bed too, then all was well. But if we stayed up later, he would go ahead without us. When you walk out of the living room and pass through the dining room, you pass by a set of windows that allow you to see the living room if you’re in the dining room, and if you’re in the living room they allow you to see the dining room. Every night when Judge went to bed early, he would stop in the dining room and look at us for a few seconds as if to say, “You sure you’re not coming?” Then he would walk on by and go to bed. A couple of days after he passed away, I saw him pass by the windows on his way to bed. I saw something and when I turned to have a better look, I saw him “going to bed,” just as clear as I see my own hands. My husband said he sees him almost every night in same place (M/H, Record 14).

The visits from my dear llama Al E. were for a time frequent and very comforting. Al E. chose to leave after his companion llama Grandpa died of old age. Al E. and I were both heart-broken. Al E. was only 7 and Grandpa had been his only friend. I quickly arranged to have two more llamas delivered to keep him company; llamas being herd animals. Al E., still grieving for his friend, would spend his days sitting on Grandpa’s grave. Two weeks after Grandpa’s death, Al E. stripped all the bark off all the cherry trees in his field and died of cyanide poisoning with me by his side. Devastated by the loss of my two best friends, I would drag myself across town early every morning before dawn to feed the new llamas. I would make the long trek through the field and up the hill to their barn. On the trip back down the hill, I would find Al E. sitting in his favorite spot under the evergreens watching me. It was such a comfort. I saw him every morning for nearly two weeks, until I guess he figured I was OK (S/S, Record 239).

Woollacott et al. (2022, p. 427) remark on the various forms visual apparitions of humans may take. Sometimes,

they look as solid as in life, whereas on other occasions, they are indistinct; they may represent the complete body or only a portion of it, and they may appear in a variety of locations. Our animal accounts reveal similar variations.

A short while after our cat Penny died, she was sleeping on our bed, then at other times licking my face and purring as usual. She visited us many times; sometimes she was solid just like in life, and at other times she was “see through” (S/S, Record 222).

Tatty was my first cat – or, rather, he adopted me. We became great friends after he used to visit me in my garden very often when I was tiny. When it became apparent that his former owners were no longer interested in him, my mum persuaded my dad to let me ‘keep’ him. He would stay very close to me and would give up whatever he was doing to come to me when I came into a room. He was a tabby, of unknown age (people in the village claimed he was over 20 when he died), and very much a ‘philosopher’ sort of cat. He gave the sense of being a very wise older soul – or to me as a toddler, he felt infinitely wondrously old and clever.

About two weeks after Tatty died, my mother and I saw his tail. This happened several times off and on for about a couple of years after he died. I only once saw the whole of Tatty many years later, in 2020, when I was ill. He stood still until I recognised him, and then disappeared. He was easy to recognise, as he had one very ginger back leg amongst his very tabby fur (M/H, Record 397).

As with humans, animal apparitions are sometimes reflected in mirrors.

My dog died after 14 1/2 years. A month or so after his death, I was looking in the bathroom mirror, and I noticed something move. I looked into the hallway, and the white shadow form of my dog walked by. He stopped and turned his head to look into the bathroom, and walked on. I thought perhaps I was imagining all this, and as I thought about what had just happened, he came back the other way – totally white form (he had been dark brindle) – stopped, turned his head to look at me, and moved on (S/S, Record 230).

I had an Eclectus parrot who was run over by a

car. He now rarely appears to me; however, after his death in early 2017, he was with me all the time for months. He was etheric and occasionally appeared visually in a mirror, at other times ghostlike (S/S, Record 259).

Woollacott et al. (2022, p. 428) received the report of an apparitional image projected on a screen, similar to the following account from our collection.

Recently my goldfish died. I found him sick one Sunday morning (he got fungus overnight) and died that Sunday afternoon. I’d had him for 6 years plus. His friend, the other fish, was very sad and lonely, and it showed. On Tuesday morning, I fell asleep on the couch and suddenly woke up around 3 a.m., still having my glasses on. Something made me look in the direction of the fish tank. I saw this “enlarged” vision of my little dead fish on the “surface” of the tank glass, as if it had been “beamed” onto it. That was there for a few seconds. It looked very peaceful, so I think it was telling me to let go (S/S, Record 268).

As reported with humans, apparitions of animals may portray the animal as younger or healthier than at death.

Our family introduced Trixie, a cocker spaniel, into our home when I was three years old. I grew up with her and became very attached to her, although she was very much my mum’s dog. After a very happy life, Trixie died when I was 16. A day or two after her death, something woke me in the night, so I got out of bed and switched on my light. Trixie, looking totally real, although much as she did when younger – her coat was glossy as it was before her illness – was sitting in the middle of my room. She was looking up at me and appeared anxious. I said, ‘It’s all right Trixie, it’s all right’, and she relaxed. Feeling that she was reassured, I switched off the light and got back into bed. To this day I really believe she was there, although I wonder why she came to me and not to my mother (S/S, Record 149).

This story doesn’t relate to a person, but to my beloved horse, Shannon, who went to sleep on 11 June 1997. I rescued Shannon when he was 24, and kept him happy and healthy for another 12 years. We spent hours together each day, as he was stabled in our garden, and out at grass in the field adjoining it. The bond between us was

incredibly close – Shannon could sense what I wanted, like which hoof to pick up as I was grooming him, or which way to stand when he was being rugged up. I always knew when he was feeling poorly, or if he wanted anything in particular for his feed – we belonged together. When he was diagnosed with cancer, it broke my heart, and I spent as much time as possible with him until the day the vet came to put him to sleep.

I cradled Shannon's head in my lap as he started to pass away, and whispered to him that I'd always be with him, and I knew he'd also be with me. He let out a little whicker, and his heart stopped. I spent hours each day at his grave, as he was buried in our field next to our house. I still left him a biscuit on the paddock fence every morning because I couldn't bring myself to stop the routine, which had been with me every day for 12 years. A month or two after he passed away, I was in the kitchen and glanced out of the window and saw him, clear as day, standing under his favorite tree, looking over at me, ears pricked up and looking as beautiful as ever. I blinked, and when I looked again, he was gone. I know how much I wanted to see him, and thought I might have conjured the image up, but when I mentioned it to my mum, she told me she'd also seen him in the field – same place, looking at the kitchen window where I used to call him from on my way to feed him (S/S, Record 225).

## Tactile Apparitions

Tactile apparitions involving humans have not been reported as commonly as visual apparitions (Strait-Horn, 2011), but almost half (47.8%) of the respondents to the survey of Elsaesser et al. (2021) reported being touched by the deceased. We defined a tactile apparition more broadly than Elsaesser and her colleagues did, to include any tactile sensation, not only direct touch. Tactile apparitions represent over a fifth (23.5%) of the ADCs in our collection of animal ADCs.

When I was a child my dog was hit by a car and died. That night in the wee hours of the morning I awoke to my dog sticking his snout into my armpit, which was something he did to get your attention. I was shocked and began to cry and gave him a snuggle, then I fell back to sleep (M/H, Record 50).

My Wee bird came back and pecked me on the face hard. Before he done that I was in a hell of grief. I didn't know where he was and was way too heartbroken (M/H, Record 48).

After an address on animal ELEs in Germany in 2023, an audience member told Nahm of an incident combining a tactile apparition with a sudden surge of energy before death (a type of ELE Sheldrake et al., 2023, termed a "last rally"). A moribund cat that had been too weak to move much had managed to jump onto its owners' bed while they slept. The woman awoke when she distinctly felt something moving around on the blanket. At that time, however, the cat had been dead for several hours, its cold body lying beside her husband across the bed.

Many of our accounts include mentions of phantom cats and dogs jumping on beds at night and snuggling up to their people, just as they did in embodied life.

I had an old calico that had renal failure and I took her to the vet who euthanized her. I brought her home and buried her in the garden. She would sleep at the foot of my bed and for two weeks after her death, I would feel her jump on the foot of the bed. After those two weeks, I didn't feel her anymore (M/H, Record 13).

I would like to tell you a story about our long-haired dachshund, Bobby. We had to put him to sleep 25 years ago, because he suddenly could not walk anymore. My parents and my son, then 13 years old, were able to say good-bye to Bobby, but my daughter, then 16, did not have the opportunity, and always felt hurt somewhat.

About five years later, my daughter came to me tear-stained and perturbed and told me that Bobby had been lying on her bed in the morning and she had felt him. The first thing I asked her was whether she was awake or had been dreaming. She wept and said that she was certain that she was awake because the dog had huddled against her and this was the second time already. I told her that if it happened again, she should use the opportunity to say good-bye to him, because this must be the reason for his appearance. And this is how it came to be—when he was there the third time, she said good-bye to him, and he never came back (S/S, Record 215).

## Auditory Apparitions

Auditory apparitions occur frequently with humans,

although they are not among the most common types of apparition (Strait-Horn, 2011). In the study of Elsaesser et al. (2021), 43.4% of respondents reported auditory apparitions, placing them in fourth place in terms of frequency. Auditory apparitions ranked third in our Combined sample, accounting for 21.8% of animal ADCs.

My cat Oreo was hit by a car and I heard his very distinct meow three times in the week after he died. He got hit and his kitty spirit just kept on running, not knowing he was dead (M/H, Record 17).

We lost our cat just before Christmas last year. Then just recently I've heard her bell and I swear I've seen her in the kitchen (M/H, Record 75).

My dog Hardy comes around. I've had a lot of pets; Hardy could be the annoying one. I spent too much time and money trying to save him, but when he died, I put him in his little bed. Set him on a table. That was 7 a.m. I left him 'til the next morning. Talked to him, crying. Then prepared his grave, set his bed, covered him with his blanket. Less than a week later, he was running around as usual, and barking. I thought I was grieving, but it's happened too many times. People don't believe me, but I KNOW WHAT I see and hear! Then he just goes away♥ (M/H, Record 95).

## Dream Visitations

The appearance of deceased humans in dreams is one of the earliest recognized types of ADC, as reported by many indigenous tribal societies (Lincoln, 1935). In his classic *Primitive Culture*, Tylor (1871) proposed that these dream visitations were one of the bases for a belief in post-mortem survival. Dream visitations also appear prominently among modern populations. Almost two-thirds (62%) of the respondents to the survey by Elsaesser et al. (2021) said they had experienced ADCs during sleep. Dream visitations appear in our samples, although less frequently than some other types of ADC. Dream visitations from animals account for only 11.2% of the ADCs we collected.

Tuppance was an Old English Sheep Dog mix. He was owned by my best friend, who lives about a half an hour from my house. After all the children had moved away and it was just Jim and the dog, she and I became very close friends. When she died, she was at the vet's where she was merci-

fully put down with Jim and me in attendance. I had this huge sense that she was so happy that we stayed until the end as we know it. One week later, I was at Jim's house sleeping and I dreamt or felt or saw her walking towards me with a happy expression on her face, tail wagging. I believed I could even hear her panting. The vision was so real that I reached to pet her, and as soon as I did, she disappeared. I woke up and sobbed. It really was like she was right there, as if to say thank you for everything and be happy, as I am happy (S/S, Record 147).

In my most recent dream of my dog Wheels, I remember being lost and her encouraging me to follow her. We travelled a long way together, and when we reached the end of the journey, she left. I subsequently told someone in the dream how much she had helped me and what a great visit we had had. This person scoffed at me, telling me that she was dead, but I was able to point her out to this person as she ran across an open field with her fur flying, as if she was flying herself. In reality, she had been killed by being run over by a car. It was particularly comforting to see her running again. This was a feeling I had in the dream. I knew throughout the dream that she had been killed, but that she was alive again (M/H, Record 34).

In some dream accounts, the animals are represented as talking. We coded these as telepathic messages, although separate from the telepathic messages classed as a subtype of Other ADC Phenomena (see below).

In 2006, my old White Shepherd passed away. He came in my dreams the following three nights. He was sitting on his grave in the free spaces of the wood. He had on an old man's hat, like my grandfather had many years ago. He explained so many things, like why he passed away, why he had to leave me, why he was my special friend, why he wore a green scarf, and so on. He visited me three nights in a row. I can visualise him in a minute, how I was with him in the dark woods, and how he sat on his grave with the hat on. His voice was a wise man's voice (M/H, Record 3).

I was 15 and Puss was my first cat. She bonded to me intensely as a kitten. I had her until my 30s, so she was my familiar through all the good and bad of my 20s. Within a few months, I had a se-

ries of visitation dreams. First one, I see her still ill and her thoughts are, “Do you really want me like this?” I said yes. Second one, I find her running round my house. I grab her and hug her. The message this time is, “You are not supposed to see me.” Third dream, she shows up glowing and healthy and walking down a hall to me: “Just visiting.” Then something regularly started jumping on my bed for quite a while. A big thump! Nothing there (M/H, Record 22).

The next dream is unique in our collection in that it apparently represents the deceased dog’s point of view.

My father and his wife had a big dog named Panda (a Bernese Mountain Dog) who died of a brain tumor while still a fairly young dog, but I knew her from when I’d visit my father and his wife. The dog died shortly before one of those visits.

When I went to bed the first night of the visit, I had a vivid dream that I was a dog. I don’t know what kind of dog, because in the dream I was the dog, so didn’t see it from an observer’s perspective. Or, seemingly, from a human perspective, as it was an experience different from any dreaming I’d had before. In the dream I was in the bedroom (the same in which I was sleeping), but my view of it was from dog-height, beside the bed. I remember things feeling very weird, starting to blur; feeling scary; anxiety, my head not right, my body losing coordination and feelings; flashing on an image of my dad’s wife. Then everything going black. I pulled myself out of the dream and woke up feeling disoriented and strange. Next morning I told my dad and Louise (his wife) about the dream and learned from them that Panda had gone into that bedroom (a guest room) and died there, at the same place beside the bed that I had been in my dream (S/S, Record 263).

### Sense of Presence

In her review of 35 studies of human ADCs, Streit-Horn (2011, p. 51) determined a sense of the presence of the deceased to be one of the three most common types of experience. About a third (34%) of the respondents to the more recent survey conducted by Elsaesser and colleagues (Elsaesser et al., 2021) reported a sense of presence. By contrast, a sense of presence figures in only 6.7% of our Combined sample, making it one of the less frequently reported types of animal ADC. This may be

because we coded a sense of presence only when respondents explicitly stated that they felt a presence distinct from other types of ADC.

Just thought I’d let you know that after my 6-year-old mare died, she stayed ‘connected’ with me for quite some time. She was my best friend, a kindred spirit, someone I could trust and depend on. Lacey was always there for me when I needed a shoulder to cry on. We knew each other’s thoughts and emotions and although she’s been gone now for two years, I can still feel her gentle soul near mine. When I’m sad or lonely, her soul lovingly comforts me and she reassures me that, although she is gone physically from my life, her spirit is with me always.

Last summer, while I was out in the pasture fixing a fence, I thought one of the other horses had come up behind me (to see what I was doing, of course) so I turned around to see which horse it was, and there was no one there. I saw the other horses—they were half a pasture away—and then I felt Lacey’s presence. It was so strong that I could even smell her sweet horsey scent. She put her head over my shoulder and I wished that we could have hugged, just as we used to do. I closed my eyes and just enjoyed that peaceful moment with her (S/S, Record 130).

Our beloved pet cat Thompson died of a tumor. Three days after he died, my husband, not a man to believe in the supernatural, was upset. He swore he saw Thompson run across part of the room behind the settee. Two days later, I was ironing, when suddenly, without thinking, I put out my arm as if to push a cat down from trying to jump up onto the ironing board. I was shocked; there was nothing there, yet I felt sure Thompson had come. I felt it; the sense was too strong. I loved Thompson, but I don’t want him to come back (S/S, Record 205).

One of our dogs came for walks with us for about two years after she died. I found I was continually counting four dogs (three live and one in spirit), as her presence was so strong. I never saw her, but could somehow tell where she was (M/H, Record 47).

### Psychokinetic Effects

Psychokinetic (PK) effects apparently have not been



reported in questionnaire surveys of human ADCs (they are not mentioned by Strait-Horn, (2011) or by Elsaesser et al., 2021), although they figure in the accounts collected by Guggenheim & Guggenheim (1996, pp. 195–210) and in some investigated cases. Green and McCreery (1975, pp. 204–210) devoted a chapter to the subject, furnishing several examples from publications of the Society for Psychological Research (SPR). Although not a major type of animal ADC, apparent PK effects were reported in 5.7% of our Combined sample.

Phenomena we coded as tactile apparitions might equally well be considered PK effects, as might some of the claimed ADCs we have classified as Borderline/Questionable. In coding PK effects, we were careful to avoid double-coding the same phenomenon, as in the following account, which we coded as tactile but not as PK.

In the mid 90's, my cat disappeared. One evening I saw him walking down the lane, and that was the last time I saw him. I searched everywhere. Several months later, on a hot summer night, as I was lying in bed, I felt something walk up my bed, and pull up the sheet. I felt spooked at the thought of something invisible on my bed, but my dog was lying asleep in the room, so I thought I'd imagined it, and lay down. As soon as I was comfortable, something pulled at the sheet, brushing my cheek as it did so. I froze, then suddenly realised it was Jim, my cat, come to tell me he was dead, and I didn't need to worry anymore (S/S, Record 204).

Phenomena we coded as ADC PK effects included impacts on the material environment.

My son was playing with the dog, with two balls attached to a rope, and he threw it so high that the toy ended up tangled on an electric wire way up high. That was 5 years ago. When the dog passed 6 months ago, I found my son crying. He said that the dog went up high to the electric wire and got the toy down for him after the dog was dead (M/H, Record 54).

Several accounts describe the manipulation or materialization of objects associated with the animals in question.

When my mother's German Shepherd dog, Lady, passed away, my mom would awaken in the morning to find the oven mitt that Lady often chewed on or snuggled with lying in the middle

of the kitchen floor. My mother always made a point of putting it away at night to make sure it wasn't a fluke, but lo and behold, there it would be in the morning. This went on for a long time after Lady died (M/H, Record 51).

I lost my dog baby June 17th of 2021, due to diabetes complications. She was my soul dog, that once in a lifetime dog. We had a very strong bond that I believe could not be broken. Even after death she has sent me so many signs, and I still receive many. At times, I even feel her presence. The first sign I got a month after she passed. I was awoken by her bark, and believe me, it was very real. I receive signs of randomly finding—still to this day—blood glucose strips like the ones I used to check her blood sugar levels. And we had we cleaned every one of those out of our house, as it was too painful to have those reminders of her being sick (M/H, Record 5).

A large subgroup of PK effects are indentations on a bed or other surface. Often, these indentations are said to be warm to the touch.

When my dear Puss cat died, a long time ago now, I just couldn't get over the grief that I felt for her. I thought about her all the time, and used to get very sad. After a couple of years of this, and not being able to get over it, one afternoon I lay on the bed for a nap, and dreamed strongly that Puss was cuddled up to my side. When I woke up, my arm was bent in a curve, as if wrapped around Puss; there was a dent on the bed as if she had been lying there, and the spot was warm. I feel absolutely that she came for a visit, and although I was still sad, was able to try and put things into perspective (S/S, Record 176).

No one can see the cat in the traditional sense, but everyone in the house is aware of what it does. I can let all the cats outside and we'll still feel a tail brush against the back of our legs. Or I'll shut all the cats out of my room and still feel paws walk across my back when I lie down, or feel random warm cat-sized spots on the bed, or hear a purr with no cat visibly present. I believe it is either my mom's old cat Opal from before I was born or a cat that was here before any of us moved here, but the temperament reminds mom a lot of Opal (M/H, Record 32).

## Olfactory Apparitions

Olfactory apparitions are an unusual, although far from unknown, type of human ADC. Some 27.6% of respondents to the survey of Elsaesser et al. (2021) reported having experienced an olfactory apparition. Olfactory apparitions account for only 2.8% of animal ADC phenomena. Smells frequently accompany other types of ADC, as described in previous accounts. Here are some additional examples:

Recently my dog (who had been living with my son and his wife for a few years) died of old age. I was sitting at home on my new sofa and I smelt the smell of a dog very strongly. I sniffed all around and there was no other odor, but I thought of Rosie. A few days later, I smelt it again (not as strong this time), but I felt sure it was Rosie that had come to visit and say she was happy – we all loved her so much, she was a very special animal. At the time, I was not thinking of her, so I don't think it was as a result of my wishful thinking, but instead it was a real visit. It was very comforting. (S/S, Record 132).

We had a dog called Kelly who died in August and on Christmas Eve I 'dreamt' she came into my bedroom and stood by the bed wagging her tail. I stroked her and ruffled her behind the ears. I didn't feel asleep and could feel her fur and smell her. The next morning my dad told me he had the exact same experience that night (S/S, Record 129).

Both my wife and I have felt the presence of our first cat. Waking up one morning I could feel her sitting on my chest purring away as she used to; I could also smell her. My wife has also felt her on the bed. It gave great comfort to know that Teddy was still about (S/S, Record 127).

## Other ADC Phenomena

Although the foregoing types are the main types of ADC with both humans and animals, Woollacott et al. (2022, p. 428) received a few reports of other phenomena in addition. Similarly, we received 22 reports (3.0% of the total) of ADC phenomena that do not fit under one of the major headings. We classed these together under Other ADC Phenomena.

A large group of these other phenomena are apparent telepathic communications between deceased animals and living humans. In order to avoid double counting tele-

pathic messaging, we excluded telepathic interchanges in dreams from the Other category. A major characteristic of these telepathic messages is their representation in words, as if the animals had spoken to or carried on conversations with our respondents. Interestingly, Woollacott et al. (2022, p. 429) report that, in some of their cases, an apparitional communicator had not spoken during his or her lifetime. For example, "A mother noted, 'My daughter died at the age of two days, so she didn't yet know how to speak; the voice that I perceived seemed neither masculine nor feminine' (F363)." Telepathic messages accounted for 54.6% of ADCs in the Other category, about 2.7% of ADCs overall.

I meditate a lot, using 432hz music to relax. Several weeks after my dog's death, he appeared in my mind while I was meditating. He looked great, like a healthy young dog, told me don't worry, don't be sad, everything is OK. He had to go. That he will be back again as a dog somewhere and his name will be Sam. Then he showed me a beautiful place but hard to describe, with a lot of dogs who all seemed happy. Before I could ask the question, he told me that the same place existed for horses. I just looked back to see a beautiful pasture with a lot of horses (M/H, Record 6).

I lost my beloved pet dog Rex, over ten years ago now. When he died, I was distraught. I was in the bath crying my eyes out, when all of a sudden Rex came to me and I heard him saying, 'It's alright now, I'm not in pain. I'm happy, so don't worry.' And I felt so calm by that. I still grieve for Rex, but thinking of that night, I feel better. The calm I felt that night I'll never forget (S/S, Record 272).

In one account, the ADC was conveyed through a burst of energy, similar to the pre-mortem burst of dog energy in the account collected by Nahm, quoted above.

My friend drove us to the Meeting for worship and brought me home afterward. As I unlocked the kitchen door, I felt deep sadness: Maxie wouldn't be there to greet me. I opened the door and stepped in. I was shoved against the cabinet at my back with a tremendous burst of dog energy: Maxie! She was bouncing and joyous. To my astonishment, with her were the five children she and I had gotten to know while we were living alone in my cabin in Petrolia CA. These were children who were in what are called the astral planes, now they were joined with Maxie. The

combined energy was literally stopping me from moving in the narrow corridor. I laughed in delight. Maxie was asking me if she could go with the children (S/S, Record 216).

A third sub-group of other ADC phenomena consists of the feeling of electric currents coursing through the percipient's body. Woollacott et al. (2022, p. 429) comment on the "flow of energy" that sometimes accompanies visual apparitions. "One woman shared, 'I felt most profoundly in all my being an enormous energy moving through my spine' (F152). Another said, '[There was a] wonderful flooding of energy all over, and on specific body parts when touching, caressing, kissing me' (E211)." This flow of energy was reported in several of our accounts, sometimes accompanying the sense of presence of a deceased pet.

My husband and I experienced the presence of our cocker spaniel after her death last November. She had lymphoma and after doing chemotherapy, she relapsed. After much soul searching, we had her put to sleep when she started having problems. Even though we knew it was the right thing to do at the right time, we struggled with the decision.

She had been gone about 2-3 weeks. I was standing in the living room talking to my husband, who was in the next room, when I suddenly became very aware of a presence beside me. I stopped mid-sentence and turned around, but I could not see anything. Yet I felt a familiarity with everything in me that it was Ali. The presence seemed to radiate upward from the floor, beside me to almost eye level, then I felt her energy flow through me. The only way I can describe it is to say that it was an overwhelming sense of being with her, and a sense of nothing but love and peace. I felt a warm, tingly, heavy feeling pass through my body. I have never experienced anything like it. I was immediately brought to tears. This warm feeling lasted about 20 minutes, fading gradually until it was gone (S/S, Record 141).

I want to tell you about my pet cat, Perky. We were very close and had 17.5 years together. I had someone else take him to be euthanized, as it was too painful for me. He had developed a cancerous tumor. I was at work for the day, teaching Grade 3. All day I was very irritable and struggled to keep my patience. At 1:20 pm, I felt a cleansing

rush of energy from my legs up through my body and out the top of my head. Then I felt peace and I knew he was sending me his relief from pain. (S/S, Record 146)

A fourth sub-group of other reported ADC phenomena concerns the supposed influences of the dead animal on the behavior of the living, either humans or another animal in the family. The following example continues the story of Perky.

Perky sent us two homeless kittens. My daughter found them wandering in a field. When we had had them for three years, I was feeling ill and lay down. The male cat came and jumped up on the bed and lay by my legs. Then, I thought, "Perky, I miss the way you would curl up by my neck to comfort me when I felt ill." The male cat, Kipper, got up and came to my shoulder. Then, he curled up by my neck and stayed with me for a while. I knew Perky had heard my prayer and encouraged Kipper to lay the way he used to (S/S, Record 146).

A fifth sub-group of phenomena we assigned to the Other category consists of events that are recognized as signs or synchronistic occurrences. We coded most signs and synchronicities as Borderline/Questionable, but when they were reported along with other ADC phenomena, we coded them as a subtype of Other in order to avoid double coding ADC and B/Q reports.

My cat, Salem, was seriously my soul mate. We shared such a pure bond and connection. He seemed to love the song, 'Sky Full of Stars', by Coldplay. I lost him in 2015 to congestive heart failure; he was 14 years old. The night we buried him, I begged him to send me a sign that he was okay. As I turned to walk away from his resting place, I saw a shooting star. Mind you, I'd never seen a shooting star before that moment. I went in the house, sobbing and exhausted. Before I went to bed, I stood in the window, staring at his grave, still inconsolable, when I saw another shooting star. Two shooting stars on the very night that he passed away and we laid him to rest. I haven't seen a shooting star since. I have seen him and felt him many times since. My Salem watches over me. I just know I'll hold him in my arms again (M/H, Record 55).

Two years ago I had to let my dog die. He had

been sick for a very long time and suffered a lot. After his death, it was as if I tripped over him in the house. Sometimes I had to make a sudden strange move to 'avoid' him, that's how it felt. I went to see a friend to meditate together to lessen my grief. The moment I thought about my dog, he jumped at me and started to lick my face. That was strange, because it was a Tibetan Mastiff and those dogs (and mine) never act like that. It became very clear that he wanted to thank me for making the decision to let him die. For me as a Buddhist that was a great comfort, after months of considerations. He stayed with me to comfort me and was now free to go.

I noticed after a while that his 'presence' in the house was gone after that day. Months later in my garden (at the spot he was buried) grew two big, flat, bright orange mushrooms, very beautiful. I had never seen them before nor afterwards in my life. I like to look at this as a gift from Buddhi (my dog) to me (S/S, Record 220).

We assigned all of our Other ADC phenomena of to one of these five sub-groups.

### Borderline and Questionable Accounts

The following accounts were submitted to us as ADCs, but we consider that interpretation particularly uncertain or dubious, so we have set them aside. We provide examples here so that the difference between B/Q accounts and accounts we included in our ADC analysis can be seen. We classified 24 accounts as B/Q—about 5.2% of the total number of accounts we collected if combined with the ADC accounts summarized in the top section of Table 2.

A large subgroup of B/Q accounts are those that involve purported symbolic signs or synchronistic occurrences. Elsaesser et al. (2021; Woollacott et al., 2022) did not include questions about these in their survey, but they were reported to Guggenheim and Guggenheim (1996, pp. 211–228), and Strait-Horn (2011) acknowledged signs as a type of human ADC. Vlahos (2023, pp. 34, 40) describes two examples.

Signs and synchronicities figure large among animal ADC signs in the popular literature (e.g., K. A. Anderson, 2017; Gutro, 2017; Ragan, 2015), but we passed over these in building our database. The numbers in the bottom section of Table 2 and therefore, omit the Lit sample. None of the accounts with signs and synchronicities we have classified as B/Q include ADC phenomena other than the perceived signs and synchronicities.

When my dog went missing for 7 weeks and turned up dead in someone's pool, I was inconsolable. Every day I cried over everything, but my heart was broken and I blamed myself. One afternoon after Lockdown, I was stood out front, crying and missing my girl as usual, when suddenly a beautiful red admiral butterfly (my favourite) landed on my top and just stayed there, looking at me. I thought it was just having a rest and I stared at it and said, 'Kizzy, if that's you, please open your wings', and it opened them really wide. I felt elated, and it just stayed there for ages (M/H, Record 63).

My beloved Airedale, Daisy, was hit by a car one evening. By the loud sound (as if a big tree had been hit), I knew it would be fatal. She wasn't allowed near the road, but was allowed back in the meadow behind my house. This is where I found her, barely standing. I carried her home and comforted her for a few minutes while we said our goodbyes. The next morning I awakened very, very early. I went out on the back step and a very large gray dove slowly flew down right in front of me. Then it slowly flew away. I felt instantly comforted and knew it was Daisy in symbolic and non-frightening form, back to give me a moment of comfort. There wasn't another bird awake or chirping, too early. And I have never ever seen another dove around here (S/S, Record 273).

About one week after my dog died, I was driving my car. I didn't want to hear the radio, but thought, "What if Feisty is trying to get a message to me through radio waves?" So I turned the radio on. It was music I didn't like. So I said to myself, "Okay, one more try and if there is no message from Feisty, I will just turn it off." In my heart I knew there would be a message on the next channel. Sure enough, the next channel was a woman singing a song named "I Love my Dog." I felt a wave of peace come over me while I drove listening to it. I used to always tell my dog I loved him at least ten times per day. He knew what it meant; his eyes would half shut in response and a grin would come on his face (S/S, Record 267).

If not simply coincidence, some uncertain ADC claims, such as the last, might be mediated by the per-  
cipient's psi.

I had two part-Burmese sister cats, Rocher and Koo Koo. I had had them for about ten years, since their birth to my ex-boyfriend's cat, their mother. There came a stage where I had to move to a place where I could not have cats and my step-mother said that she would mind them for me. I probably left them too long with her, but she professed to being a great animal lover all the time and seemed happy to have them. However, she wasn't. I dreamt that they were in great danger and awoke in a sweat. I rang her the next day and said that I can take the cats off her hands now, because my then-boyfriend would take them, but she said that it was too late, that she had given them away to a nice old lady. But because I had the dream, things started to click in my head. I called her vet and I found out that she had had them put down. (I haven't spoken to her since, by the way) (S/S, Record 187).

The deceased animal's PK might be responsible for the following account, but because it could also be due to the human experiencer's PK and is accompanied by no other ADC types, we have classified it as B/Q.

My email to you relates to a powerful experience I had a year ago when I euthanized my dear horse. We had a strong bond developed over 11 years. Without going into unnecessary detail, the experience I am "haunted" by occurred some moments after the vet declared him dead. I walked alone back to his stall and suddenly there was a substantial temperature drop, followed by a sudden and strong wind gust which unhooked his upper stall door and slammed it shut with some considerable force. Nothing else was affected by the wind, which subsequently disappeared. It was notably odd because of the protection that his stall was afforded by a tall hedge, low overhanging roof, etc (S/S, Record 278).

An important kind of potentially living-agent-psi-mediated ADC occurs coincidentally with deaths. We coded 30 accounts (6.8%) as having death coincidence. Most of these accounts include elements that seem to direct attention away from the percipient's psi as a factor, but there are exceptions.

I am 14 years old, from Austria. I had a hare all my life. Her name was Schneeflöckchen. She was old and weak and I knew she would not live much longer. A year ago, she died. One night I dreamed

of my friends, and in the middle of the dream, a picture of my Schneeflöckchen appeared like a flash. Then it was gone and my dream continued. When I woke up in the morning, I knew that she had died. I went out to her hutch and saw it was true (S/S, Record 366).

I seemed to achieve excellent rapport with one indigo snake, an elderly creature that just did not move except for me. Then in the early hours of January 1st, 1995, I awoke from a very vivid dream of this creature, in which it was plainly trying to tell me something. Having had just the same experience with my brother when he passed away in June 1989, I guessed what the snake had been telling me and, sure enough, when I next visited the zoo a few days later, I was informed that it had died in the early hours of January 1st (S/S, Record 365).

I was deeply connected to my cat Brigit, who died in 2005. Four years ago I was leaving the country for a number of months and a friend who loved Brigit adopted her. Upon my return to Canada, I moved 2,500 miles away from Brigit. One night last year, I was awakened in the night from a dream with an explosion of light, bolting upright from a deep sleep. I then felt pain throughout my body, but I had no sense why I had such an experience. The next day, I experienced diarrhea and actually lost control of my bowels. That had never happened before. That day my friend e-mailed me to tell me Brigit had not come home from her nightly roaming. She never returned. I feel that that Light was Brigit communicating her sudden death to me. The loss of bowel control was due to the shock to my system, for I was so deeply connected to her (S/S, Record 274).

We collected three accounts with photographic anomalies believed to be related to deceased pets. Due to the considerable controversy surrounding photographs with anomalous features, we feel it is better to classify these accounts as B/Q rather than under Other ADC Phenomena.

We were able to assign all of our B/Q accounts to one of the three sub-groups: Signs and Synchronicities, Living-agent psi, and Photographic anomalies.

## DISCUSSION

The similarity between human and animal ADCs is

remarkable. Not only are the experiences of the same general types, but the relative incidence of the types follows the same pattern, with visual apparitions among the most common and olfactory apparitions among the least common. Several ancillary features, such as apparent telepathic communications between the dead and the living and strange electrical sensations in association with the phenomena, appear in both human and animal ADCs. Additionally, both human and animal ADCs have a strong tendency to appear in the first hours or days after death. Deceased pets have sometimes been perceived during near-death experiences (NDEs) as well. Examples are given by Atwater (2007), Randall (1950), Rivas et al. (2016), and Serdahely (1990). Occasionally, animals perform the same role as human loved ones in directing the NDEr to return to his or her body before it is too late (Serdahely, 1990, p. 34). These NDE animal encounters may be considered another form of ADC, thus highlighting the interrelatedness of different death-related phenomena, although we have not extended our coverage to include them here.

Since the pioneering paper of Rees (1971), much human ADC analysis has focused on the experiences of widows and widowers, who frequently report the sense of presence and apparitional encounters. Still, the dominant position in bereavement theory (and grief counseling) for much of the 20th century was the idea that the surviving spouse needed to cut ties to their departed loved ones, the better to invest in new relationships. Klass et al. (1996) made a theoretical advance with the concept of “continuing bonds,” according to which ADCs are normal and healthy. Marwat and Klass (1996) stated that “the role(s) played by the inner representation of the deceased provides a theoretical framework for thinking about the place of the deceased in the ongoing lives of the living,” making clear that “inner representation” included “a sense of presence, hallucinations in any of the senses,” and “belief in the person’s continuing active influence on thoughts or events” (p. 298). Silverman and Nickman (1996) remarked that the relationships thus constructed “can be described as interactive, even though the other person is physically absent” (p. 349).

The continuing bonds model was developed further in a collection edited by Klass and Steffen (2017). Elsaesser et al. (2021) cite the model, adding that the ongoing contact :

is typically interpreted by the recipient as conveying (explicitly or implicitly) one or more of the following sentiments (which we have termed the ‘four Rs’): ‘reassuring’, ‘I’m fine, don’t worry about me, the troubles I had at the end of life are

now behind me; ‘resolving’, settling old conflicts, allowing space for apologies and providing closure; ‘reaffirming’, continuing bond, affectionate, I love you, I will always be by your side, we’ll meet again one day; and ‘releasing’, don’t be sad, pursue your life, don’t hold me back by your suffering (Elsaesser, 2001, p. 2).

It is easy to identify examples of each of the four R’s in the animal ADC accounts we collected. Grief over the loss of an animal to which one was tightly bonded closely resembles grief over the loss of a spouse. Rees (2001, pp. 256–262) made this point in a chapter on “The Death of a Pet,” although he supplied no ADC examples. Kowalski (2012) reported that for some people, the loss of a pet can represent the greatest loss they have ever encountered.

We are not aware that the depth of grief in connection to ADCs has been investigated with either humans or animals, but from the accounts we collected, it would appear that the people most likely to experience animal ADCs are those who feel the loss of their pets most keenly. This association may be interpreted in one of two ways—either the humans’ grief caused them to hallucinate visits from their animal friends, or the animals responded to their humans’ emotional state by coming to ameliorate their suffering. Several of the narratives presented above demonstrate that percipients understood visitations in the latter manner. Nonetheless, in some of the accounts in which ADCs seemed to coincide with deaths (which we coded as B/Q and excluded from our ADC analysis), the content of the experience is different and often described as unsettling or frightening—just as it is the case with ADCs among humans (Nahm, 2011). These cases can plausibly be regarded as “crisis telepathy” initiated either by the dying animal or living human agents, and this raises the question of whether all ADC accounts might best be regarded as grounded in the percipients’ psi (Nahm, 2010).

Woollacott et al. (2022) discussed the bearing of their findings with human ADCs on three hypotheses: ADCs (1) occurred internally in the minds of the percipients as hallucinations; (2) were mediated by the percipients’ telepathy; or (3) were “perceived as being sensed externally through the senses or through extra-sensory means in the physical environment” (p. 430). Woollacott et al. (2022) concluded that all things considered, their findings were “more compatible with hypotheses 2 and 3 than hypothesis 1” (p. 430). The authors of Klass et al. (1996) and Klass and Steffen (2017) appear to be committed to Hypothesis 1, however. Their version of the continuing bonds model takes ADC experiences into account but assumes them to be internal hallucinations—albeit non-pathological

ones—rejecting and trivializing the perspective of the experiencers themselves. The continuing bonds model thus formulated remains the dominant position in human bereavement studies, but there are dissenters (e.g., Fenwick & Fenwick, 2008; Guggenheim & Guggenheim, 1996; Vlahos, 2023), primarily from the clinical side, who take the view that these experiences signal the survival of human consciousness after death, and the theoretical consensus may eventually shift again.

Given the many parallels between human and animal ELEs documented by Sheldrake et al. (2023), it is perhaps not surprising to see the parallels extend from peri-mortem to post-mortem phenomena. ADC accounts raise the same questions about the nature and evolutionary development of consciousness as the ELE accounts, elevated to a new level by the suggestion that animal as well as human consciousness survives bodily death. In a follow-up paper, Matlock and Hilton (forthcoming) will delve deeper into our data and consider implications for the understanding of consciousness and the prospect of post-mortem survival of animals as well as humans.

## IMPLICATIONS AND APPLICATIONS

Sheldrake et al. (2023) showed that the end-of-life experiences of animals are very similar to those of humans. We have taken the next step, demonstrating a close resemblance between after-death communications from animals and from humans. That people grieve their pets in very much the same way they grieve their human loved ones suggests that human bereavement studies would do well to take into account the animal data to which we have drawn attention. Doing so may help clarify issues regarding the fundamental nature of the experiences—determining whether they are best regarded as internal hallucinations, as living-agent-psi-mediated subjective or objective phenomena, or as actual contacts with the deceased—which in turn carries implications not only for academic studies of bereavement but for clinical practice with the bereaved.

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## AUTHOR CONTRIBUTIONS

James Matlock (ORCID: 0000-0003-1280-2476): Project conceptualization, data collection for M/H and Lit samples, coding, writing – first and final drafts. Bethany Hilton (ORCID: 0009-0009-6259-4696): Data collection for M/H and Lit samples and integration with S/S sample, combined data curation, coding, database queries. Rupert Sheldrake (ORCID: 0000-0001-8814-4014): Project conceptualization, data collection for S/S and PL samples, comments on paper draft and substantive contributions to revision. Pam Smart: Data curation and categorization of S/S sample. Michael Nahm (ORCID: 0000-0003-1930-9692): Project conceptualization, data collection for Lit sample, comments on paper draft and substantive contributions to revision.

## Supplementary Materials

A Microsoft Excel spreadsheet containing the essential data of this study is available on Sheldrake's website at <https://www.sheldrake.org/research/ADC>.

## ENDNOTES

- 1 Henceforth, we use “animal” in the sense of non-human animals.
- 2 The term “after-death communication” was introduced by Guggenheim and Guggenheim (1996).
- 3 We follow Matlock in distinguishing an account from a case. In Matlock's terminology, a case is “a set of events that have been investigated or closely observed.” By contrast, “an uninvestigated *account* is a story or anecdote about whose reliability we can say nothing” (2019, p. 91). Matlock here is concerned with cases and accounts suggestive of reincarnation, but the same applies in principle to any realm of experience.
- 4 These groups were Afterlife Awareness and After-Death Communication, Re-incarnation, Pet Reincarnation, and Signs of Reincarnation.
- 5 Although Bozzano's book is written in Italian, he translated most of the accounts and cases from English-language sources.
- 6 Ten accounts were taken from the blog posting, and 65 from the associated comments
- 7 Elsaesser et al. (2021) say that they use “hallucination” in an “ontologically neutral” sense, but since this term more commonly implies illusion, we prefer “apparition” as the more neutral term, following Streit-Horn (2011) and the bulk of the ADC case literature. Apparitions in our terminology are externalized perceptions that may have a visual, auditory, olfactory, or tactile basis. Apparitions contrast with the more internalized ADCs involved in dream visitations and the sense of presence. Woollacott et al. (2022) employ the term “perceptions” to cover both

internalized and externalized ADCs. Gurney et al. (1886) appear to have been the first to contrast internalized and externalized hallucinations or apparitions.

- <sup>8</sup> Accounts we classified as Borderline/Questionable included those consisting exclusively of symbolic signs or synchronicities, phenomena that seems equally well or better interpreted as mediated by living-agent psi, and accounts relying on photographic evidence.
- <sup>9</sup> Flammarion's (1923) graph was inspired by an earlier and simpler version of such a graph contained in Frederic W. H. Myers' monumental treatise on the human survival of bodily death (Myers, 1903, vol. 2, p. 14). Apparitions perceived "before death" were of individuals in a weak or comatose state but not yet deceased.
- <sup>10</sup> We coded grief as present only when respondents said they were grieving. We did not code grief as present in instances in which it could be presumed. It should be remembered that these figures represent only what was recounted spontaneously. The true figures for grief and relief were almost certainly higher, or would have been, had we asked about these factors in a questionnaire format. Rather her cat did not come back, were reported only in one account.

## REFERENCES

- Anderson, E. (2021). *Evidence of animal afterlife*. Author.
- Anderson, K. A. (2017). *The amazing afterlife of animals: Messages and signs from our pets on the other side*. Painted Rain.
- Atwater, P. M. H. (2007). *The big book of near-death experiences*. Hampton Roads Publishing.
- Bayless, R. (1970). *Animal ghosts*. University Books.
- Bozzano, E. (1950). *Gli animali hanno un'anima?* Armenia Editore.
- Elsaesser, E., Roe, C. A., Cooper, C. E., & Lorimer, D. (2021). The phenomenology and impact of hallucinations concerning the deceased. *BJPsych Open*, 7, Article. e148, 1–5. <https://doi.org/10.1192/bjo.2021.960>
- Fenwick, P., & Fenwick, E. (2008). *The art of dying: A journey to elsewhere*. Bloomsbury.
- Flammarion, C. (1923). *Death and its mystery: After death*. T. Fisher Unwin.
- Guggenheim, B., & Guggenheim, J. (1996). *Hello from heaven! A new field of research—after-death communication—confirms that life and love are eternal*. Bantam.
- Gurney, E., Myers, F. W. H., & Podmore, F. (1886). *Phantasms of the living* (2 vols). Rooms of the Society for Psychical Research.
- Gutro, R. (2017). *Pets and the afterlife: Messages from beyond* (Rev. ed). CreateSpace Independent Publishing Platform.
- Haraldsson, E. (2012). *The departed among the living: An investigative study of afterlife encounters*. White Crow Books.
- Klass, D., Silverman, P. R., & Nickman, S. L. (Eds.) (1996). *Continuing bonds: New understandings of grief*. Taylor & Francis.
- Klass, D., & Steffen, E. M. (Eds.) (2017). *Continuing bonds in bereavement: New directions for research and practice*. Routledge. <https://doi.org/10.4324/9781315202396>
- Kowalski, G. (2012). *Goodbye, friend: Healing wisdom for anyone who has ever lost a pet*. New World Library.
- Lincoln, J. S. (1935). *The dream in primitive cultures*. William & Wilkins.
- Matlock, J. G. (2019). *Signs of reincarnation: Exploring beliefs, cases, and theory*. Rowman & Littlefield.
- Matlock, J. G., & Hilton, B. (forthcoming). After-death communications from non-human animals: Interpreting the data.
- Mail Online Reporter (2016). After Bel Mooney revealed how her dog came to her after death, even sceptics will now ask: Can dead pets really come back to comfort their owners? [26 Aug 2016, updated 27 Aug 2016] <https://www.dailymail.co.uk/news/article-3760804/amp/After-Bel-Mooney-revealed-dog-came-death-sceptics-ask-dead-pets-really-come-comfort-owners.html>
- Marwat, S. J., & Klass, D. (1996). Grief and the role of the inner representation of the deceased. In D. Klass, P. R. Silverman, & S. L. Nickman (Eds.). *Continuing bonds: New understandings of grief* (pp. 297–310). Taylor & Francis.
- Mooney, B. (2016a). *Goodbye, pet & see you in heaven: A memoir of animals, love and loss*. Robson.
- Mooney, B. (2016b). My little dog came to me after her death - then led me to the waif that soothed my soul: Bel Mooney on how a message changed her life all over again. *Daily Mail*. <https://www.dailymail.co.uk/femail/article-3752244/My-little-dog-came-death-led-waif-soothed-soul-BEL-MOONEY-message-changed-life-again.html>
- Myers, F. W. H. (1903). *Human personality and its survival of bodily death* (2 vols.). Longmans, Green and Co. <https://doi.org/10.2307/1412223>
- Nahm, M. (2010). Letter to the Editor [On mediumistic communications by living agents], *Journal of the Society for Psychical Research*, 74(1), 53–56.
- Nahm, M. (2011). Reflections on the context of near-death experiences. *Journal of Scientific Exploration*, 25(3), 453–478.
- Nahm, M. (2016). The role of animals as co-percipients of apparitions in the work of Emil Mattiesen (1875–1939). *Journal of the Society for Psychical Research*, 80(2), 119–121.

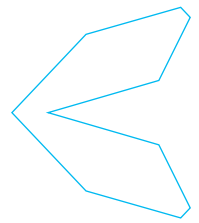


- Ragan, L. (2015). *Signs from pets in the afterlife: Identifying messages from pets in Heaven*. Afterlife Communications.
- Rainbolt, D. (2017). *Ghost cats: Human encounters with feline spirits* (rev. ed.). Stupid Gravity Press.
- Randall, V. D. (1950). Return to life. *Fate*, 4(4), 53-54.
- Rees, W. D. (1971). The hallucinations of widowhood. *British Medical Journal*, 4, 37-41. <https://doi.org/10.1136/bmj.4.5778.37>
- Rees, [W.] D. (2001). *Death and bereavement: The psychological, religious and cultural interfaces* (2nd ed). Whurr.
- Rivas, T., Dirven, A., & Smit, R. H. (2016). *The self does not die: Verified paranormal phenomena from near-death experiences*. International Association for Near-Death Studies.
- Serdahely, W.J. (1990). Pediatric near-death experiences. *Journal of Near-Death Studies*, 9(1), 33-39. <https://doi.org/10.1007/BF01074099>
- Sheldrake, R. (1994). *Seven experiments that could change the world: A do-it-yourself guide to revolutionary science*. Fourth Estate.
- Sheldrake, R. (2011). *Dogs that know when their owners are coming home* (2nd ed.). Crown.
- Sheldrake, R., Smart, P., & Nahm, M. (2023). Experiences of dying animals: Parallels with end-of-life experiences in humans. *Journal of Scientific Exploration*, 37(1), 42-58. <https://doi.org/10.31275/20232773>
- Silverman, P. R., & Nickman, S. L. (1996). Concluding thoughts. In D. Klass, P. R. Silverman, & S. L. Nickman (Eds.). *Continuing bonds: New understandings of grief* (pp. 349-355). Taylor & Francis.
- Streit-Horn, J. (2011). A systematic review of research on after-death communication (ADC). Ph.D. dissertation. University of North Texas.
- Tylor, E. B. (1871). *Primitive culture: Researches into the development of mythology, philosophy, religion, art, and custom* (2 vols.). John Murray.
- Vlahos, H. (2023). *The in-between: Unforgettable encounters during life's final moments*. Ballantine.
- Warren, J. P. (2006). *Pet ghosts: Animal encounters from beyond the grave*. New Page Books.
- Woollacott, M., Roe, C. A., Cooper, C. E., Lorimer, D., & Elsaesser, E. (2022). Perceptual phenomena associated with spontaneous experiences of afterdeath communication: Analysis of visual, tactile, auditory and olfactory sensations. *Explore*, 18(4), 423-431. <https://doi.org/10.1016/j.explore.2021.02.006>
- Bayless, R. (1970). *Animal ghosts*. University Books.
- Bivona, G. S., Whittington, M., & MacConachie, D. (Eds.) (2004). *Personal stories of departed pets*. Atriad Press.
- Bozzano, E. (1950). *Gli animali hanno un'anima?* Armenia Editore.
- Cheung, T. (2016). *Conversations with heaven*. Simon & Schuster UK.
- Eason, C. (1994). *The psychic power of children*. W. Foulsham.
- Grace, S. (2022). *Yes, pets do go to heaven!* Self-published.
- Green, C., & McCreery, C. (1975). *Apparitions*. Hamish Hamilton.
- Gaddis, V., & Gaddis, M. (1970). *The strange world of animals and pets*. Cowles.
- Gutro, R. (2017). *Pets and the afterlife: Messages from beyond* (rev. ed). CreateSpace Independent Publishing Platform.
- Gutro, R. (2020). *Pets and the afterlife 2: Stories of signs from pets that passed*. Amazon Publishing.
- Gutro, R. (2020). *Pets and the afterlife 3: Messages from Spirit Dogs*. Amazon Publishing.
- Mannes, E. (2018). *Soul dog: A journey into the spiritual life of animals*. Bear & Co.
- Mooney, B. (2016a). *Goodbye, pet & see you in heaven: A memoir of animals, love and loss*. Robson.
- Mooney, B. (2016b). My little dog came to me after her death - then led me to the waif that soothed my soul: Bel Mooney on how a message changed her life all over again. *Daily Mail*. <https://www.dailymail.co.uk/femail/article-3752244/My-little-dog-came-death-led-waif-soothed-soul-BEL-MOONEY-message-changed-life-again.html#reader-comments>
- O'Donnell, E. (2012). *Animal ghosts: Animal hauntings and the hereafter* (Centennial ed., revised and updated. Originally published 1913). John E. L. Tenney.
- Ragan, L. (2015). *Signs from pets in the afterlife: Identifying messages from pets in Heaven*. Afterlife Communications.
- Rainbolt, D. (2017). *Ghost cats: Human encounters with feline spirits* (rev. ed.). Stupid Gravity Press.
- Rainbolt, D. (2022). *Ghost cats 2: More afterlife encounters with feline spirits*. Stupid Gravity Press.
- Schul, B. [D.] (1977). *The psychic power of animals*. Fawcett.
- Sheridan, K. (2006). *Animals and the afterlife: True stories of our best friends' journey beyond death*. Hay House UK.
- Steiger, B., & Steiger, S. H. (1992). *Strange powers of pets*. Donald I. Fine.
- Steiger, B., & Steiger, S. H. (1994). *More strange powers of pets*. Donald I. Fine.
- Warren, J. P. (2006). *Pet ghosts: Animal encounters from beyond the grave*. New Page Books.

## DATABASE SOURCES

Anderson, E. (2021). *Evidence of animal afterlife*. Self-published.

Warren, J. P. (2006). *Pet ghosts: Animal encounters from beyond the grave*. New Page Books.



**RESEARCH  
ARTICLE**

# Binaural Beats and Music: A Preliminary Case Report

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## HIGHLIGHTS

Improved brain function, cardiovascular activity, and bioenergy effects can occur when binaural beats (a “pulsation” felt when two slightly different tones are played in each ear) are added to brown noise, or to music plus brown noise.

## ABSTRACT

We recruited subjects who reported feeling stressed and needing a break and were seeking an opportunity to experience relaxation. Inaudible binaural beats (BB) were used to measure the ability of BB to induce relaxation. Measurements included EEG, Menlascan (cardiovascular and ANS) (Menla Technologies, Independence, Missouri), and GDV (Gas Discharge Visualization/Kirlian Photography) (Korotkov et al., 2020). Further, a Big Five Character Assessment was administered, and individual Brief Mood Introspection Scales (BMIS) were collected for each condition. Subjects experienced an improvement in brain function, microcirculation or cardiovascular score, bioenergy, and a calmer brain after adding binaural beats to brown noise or to music plus brown noise, although the Menlascan scores and Big Five character assessment results were less conclusive. BB seems to have profound effects on the physiology of subjects, and since the beats were not audible, these effects could not be attributed to the placebo effect. These results are encouraging in terms of developing musical products incorporating BB to affect human neural rhythms and corollary states of consciousness and warrant further research with more subjects and different frequencies of BB and different music tracks.

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## KEYWORDS

Audio beats, auditory illusion, binaural beats, bioenergy, frequency following, neural response, neural rhythms.

## INTRODUCTION

This preliminary case study aimed to assess the effects of adding binaural beats (BB) to music on the brain, bioenergy, and physiology of four study participants. Theories of bioenergy propose that electromagnetic fields are associated with basic life processes and that each human being radiates an electromagnetic field that can be described as an “aura” or field of bioenergy (Prakash et al.,

2015). Peer-reviewed research on human bioenergy and aura includes topics such as stress levels (Abdullah et al., 2014) and the influence of bioenergy on the conformation of human DNA (Rein, 1995). Instruments currently used to detect bioenergy fields measure aspects of electromagnetic activity (Deshpande et al., 2016; Hansen & Lieberman, 2014; Prakash et al., 2015).



## METHOD

Study participants were randomly selected to participate twice on two consecutive days, with two male participants in the first week and two female participants in the second week, one week apart. A total of four auditory stimulations were administered during their two sessions, each session (Part 1 and Part 2) having two stimulations. The room was kept dark and quiet, and the participants were read a 1-minute relaxation script written by the Sponsor prior to each session. The same relaxation script was used for each session.

The four-day study began on October 31, 2021. All four subjects were tested at the same times on all four days to control for circadian rhythms, which may impact response to BB (Atwater, 2001; Rossi, 1986; Shannahoff-Khalsa, 1991; Webb & Dube, 1981).

The following was the schedule:

Week 1 Day 1: Subject 1 - 9 am, Subject 2 - 1 pm  
Day 2: Subject 2 - 9 am, Subject 1 - 1 pm

Week 2 Day 3: Subject 3 - 9 am, Subject 4 - 1 pm  
Day 4: Subject 4 - 9 am, Subject 3 - 1 pm

Each participant listened to the control track first and then the BB-enhanced track second so that we could clearly measure the difference between the Control Condition and the BB Condition. Subjects 1 and 3 began Day 1 at 9 am with Part 1 (Conditions 1 and 2), and subjects 2 and 4 began Day 1 at 1 pm with Part 2 (Conditions 3 and 4). This allowed everyone to listen to their four musical tracks at the same time of day. The two sequences were: Part 1: Condition 1 (brown noise only) and Condition 2 (brown noise plus binaural beats) and Part 2: Condition 3 (brown noise plus music) and Condition 4 (brown noise plus music plus binaural beats).

The study Sponsor provided the four auditory stimulation files, which were unidentified except for numbers 1 to 4, to provide a double-blind condition. The double-blind condition was met by keeping the track identities secret; neither the participants nor the lab assistant knew which track contained which condition. The tracks were presented to the lab only named 1- 4, so no one knew what those numbers represented. All audio tracks were 10 minutes long due to research showing a duration of at least 8 minutes is needed for the brain to resonate to the offered frequencies (Garcia-Argibay et al., 2019). The control condition was met by having each audio condition created both with and without the BB and presenting the non-BB condition first so that the difference could be tracked and measured. The study was conducted at

PsyTek Labs, a licensed clinical and public health research lab, in collaboration with the California Institute for Human Science (CIHS), by principal investigator Gaétan Chevalier, PhD, who is the Research Director.

Headphones are required for using binaural beats. The study Sponsor supplied the headphones. All participants used the same brand and serial number of headphones (Blue Lola Sealed Over-Ear) and the same auditory volume (40 dB) for all audio conditions. The musical track was composed in the ambient relaxation genre using piano music and synthesizer pads at a tempo of 60 bpm. Binaural beats were added in Protools, a professional audio production software. The musical track was titled Relax 1. The BB added were Theta at 4 Hz (4 cycles per second) and Alpha at 8 Hz (8 cycles per second).

These frequencies were chosen for their correlation to deep, inward, yet awake meditative states (Shapero & Prager, 2020). The carrier frequency selected was 440 Hz. The exact formula was 438 Hz in the left ear, 442 Hz in the right ear for Theta, 436 Hz in the left ear, and 444 Hz in the right ear for Alpha. The carrier frequency of 440 Hz was selected due to the research that frequencies in this range are the most effective due to the size of the human skull (Atwater, 2001; Oster, 1973). The Sponsor chooses to disclose all formulas for the enrichment of the research community as a whole and invites all researchers to do the same. The Sponsor has previously made all BB dissertation research available as open source to this community.

A combination Alpha-Theta frequency was chosen due to the findings of Garcia-Argibay et al. (2019), which showed that mixed frequencies were more effective. This was also the conclusion of pioneer researcher Atwater (2001). The Sponsor chose to make the BB (and brown noise) inaudible after reading research showing that BB still produces effects even when one of the carrier frequencies is below hearing (Oster, 1973). The added benefit of inaudible BB was the removal of the placebo effect, given that the BB was inaudible and no one knew when they were present. All tracks were the same length of 10 minutes due to the research showing that a minimum of 8 minutes is needed for the brain to resonate to the offered frequencies (Garcia-Argibay et al., 2019). Brown noise contains all frequencies, like white noise, but emphasizes the lower frequencies and de-emphasizes the higher frequencies (Blum & Jamet, 2022). Research shows that pink noise is an effective binaural beats carrier (Garcia-Argibay et al., 2019). The sponsor selected brown noise instead due to personal preference; it is much easier and more pleasant to listen to 10 minutes of brown noise than pink noise, and brown noise is a comparable full-spectrum sound. The Sponsor hypothesized that adding an

unchanging brown noise carrier tone under the musical track, which has variations, would more effectively carry the BB. The numerical data extracted from the EEG analysis supported this outcome. Due to time limitations, the condition of the music and BB, without the brown noise, was not tested. Further research, including this condition, is recommended.

## Measures

**EPI/GDV (Electro-Photonic Imaging/Gas Discharge Visualization).** We measured the bioenergy of the subjects using the Gas Discharge Visualization (GDV). Electro-Photonic Imaging (EPI), also known as Gas Discharge Visualization (GDV), is an advanced form of Kirlian photography developed by Korotkov et al. (2010). This technology produces an electric impulse, which generates a response of the subject in the form of electron and photon emission. The glow of the photon radiation owing to the gas discharge generated from the electromagnetic field is captured by a digital camera and processed by sophisticated software where a report can be generated.

**WAVi P300.** The instrument used to measure the functioning of the brain was the brain scan platform WAVi P300 Brain Mapping System. WAVi is a non-invasive, HIPAA-compliant brain measurement platform that provides data about brain function using EEG technology to measure brain activity in response to a stimulus (Grover et al., 2017; Joffe et al., 2021; Oakley et al., 2021; Tarrant et al., 2019). WAVi can be considered as research-friendly since EEG with audio P300 has been used in health screening exams for research conducted by hospitals and clinics for clinical evaluations (Joffe et al., 2021). The P300 wave is an electrical response of the brain that shows the brain's response to stimuli as well as how quickly or easily the response occurs (Tarrant et al., 2019). P300 is considered to be an endogenous potential, as its occurrence links not to the physical attributes of a stimulus but to a person's reaction to it. More specifically, the P300 is thought to reflect processes involved in stimulus evaluation or categorization. The EEG signals are processed, and the P300 is extracted by the WAVi software.

**Menlascan.** Menlascan (Menla Technologies, Independence, Missouri) provided measurements on the cardiovascular system in response to the auditory stimulus, which refers to the heart (cardio) and blood vessels (vascular). This system distributes blood to all parts of the body and is governed by the autonomic nervous system (ANS). The ANS is a component of the peripheral nervous system that regulates involuntary physiologic processes, including heart rate, blood pressure, respiration, digestion, and sexual arousal (Waxenbaum et al., 2022). Mi-

crocirculation is blood flow through the smallest vessels of the cardiovascular system. The most important results here are the improvement of cardiovascular and microcirculation scores as the ANS is prone to rapid changes with emotions.

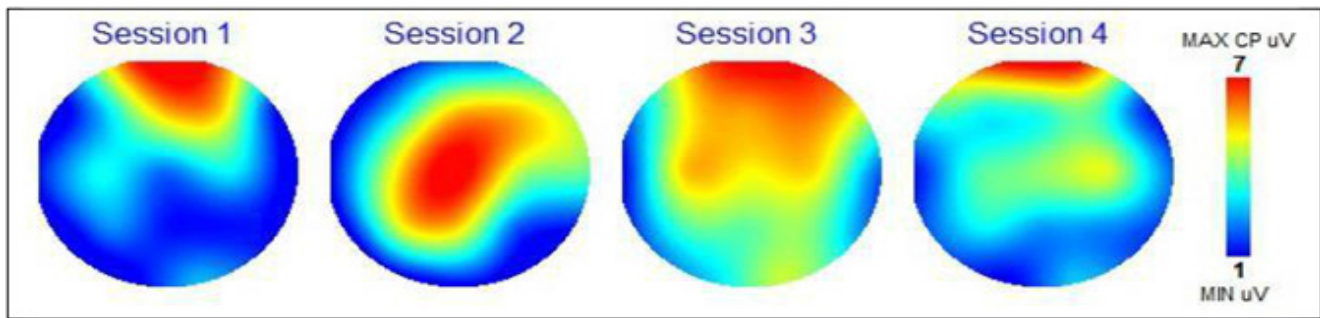
**Big Five Inventory.** The theory of five basic personality traits (Big Five) was developed by D. W. Fiske (1949). The five basic personality traits described by the theory include extraversion/extroversion, agreeableness, openness, conscientiousness, and neuroticism. Evidence of this theory has been reported by researchers including Kachur et al. (2020), and in meta-analyses by Buecker et al. (2020), Mammadov (2022), and Plessen et al. (2020).

**BMIS Assessments.** The Brief Mood Introspection Scale (BMIS) is an open-source mood scale based on 16 mood adjectives such as "Are you 'happy'?" (Mayer & Gaschke, 1988). The scale yields measures of moods including pleasant-unpleasant mood, arousal-calm mood, as well as scores for positive-tired and negative-calm mood (Mayer & Gaschke, 1988). The scale has been validated in numerous studies, including Aldrich et al. (2021), Flexer et al. (2021), and Nugraha et al. (2020). In order to evaluate any possible correlation between subjective assessment and quantitatively gathered data, participants filled out a BMIS form after each condition. Seven of the eight forms were completed. In addition to present-time mood assessments, an overall mood assessment on a scale of 1 to 10 was requested.

## Participants

The experimental group consisted of four healthy adults. Random sampling recruitment started on October 14, 2021, by posting flyers, electronic marketing, and by snowball sampling. The pilot study flyer was advertised for individuals who were looking to take a break from their stress and experience profound relaxation. All participants read and signed a standard Informed Consent form prior to participation in the study. Written informed consent was obtained from the individuals for the publication of any potentially identifiable images or data. Exclusionary criteria included having a serious illness or inability to abstain from medication or stimulants on the days of the study. The four participants were all in good health according to the demographic data they provided; any minor health conditions and medications are noted below. See supplemental files for further information.

SUBJECT 1 is a 52-year-old male (DOB 7/31/1969) dealing with high blood pressure and a stress level of 5 on a scale of 1 to 10. Subject 1 experiences stress due to money and career ambition, which affects his emotion-



**Figure 1.** Scalp Topography of Brain Response: Subject 1.

al health, and he is looking for help regulating sleep and lowering his stress levels. Exercise and meditation work for this individual.

SUBJECT 2 is a 46-year-old male (DOB 9/9/72) experiencing little stress in his life, a three on a scale of 1-10, and reports no other physical, mental, or sleep issues, just managing high blood pressure with the medication Norvasc. He is looking to enjoy the retirement phase of his life. He is just beginning his journey into self-care.

SUBJECT 3 is a 33-year-old female (DOB 02/04/1988) who has a stress level of 5 on a scale of 1 to 10. Subject 3 experiences stress due to work and relationships, which affects her emotional and physical health. She would like to achieve more relaxation, lower her stress, and sleep better. Her self-care program involves relaxation music which helps her to fall asleep at night immediately. She reports no significant physical or mental issues and is taking no medications.

SUBJECT 4 is a 52-year-old female (DOB 3/22/1969) who has predominantly anxiety at a level of 3 on a scale of 1 to 10. Subject 4 experiences menopausal symptoms such as anxiety and poor sleep, for which she takes Bijuva. Her anxiety is amplified by work and poor organization/planning ahead skills, and she would like to use BB to experience greater relaxation. She has tried over-the-counter sleep aids.

## RESULTS

The combined results for each study participant were as follows. The combined three WAVi P300 measurements for each study participant are presented first with the bioenergy results. The Menlascan results are summarized at the end. See supplementary summary charts for CZ Theta Beta Assessment Scores, F3/F4 Alpha Assessment Scores, and Menlascan Scores. There is also a sample bioenergy reading.

### Subject 1

**State CZ Theta Beta Assessment Scores.** Subject one began with a control score of 2.1, which lowered

dramatically to .8 when BB was introduced to the brown noise. In the second session, the number lowered dramatically again from 2.7 to 1.1 when BB was introduced to the music.

**State F3/F4 Alpha Assessment Score.** Subject 1 experienced the opposite of the expected outcome, instead showing a lowering of numbers from .7 to .2 when BB was added to the brown noise, indicating a more negative processing mode rather than a more positive mode. However, it correlated with his personal assessment, in which Subject 1 reported the brown noise as intolerable, saying: "Felt a "white noise" calm almost "ocean" but over time it became less calming and almost causing mild discomfort like if I was trapped in a loud "machine" room. When the headset was removed, it was a relief." By contrast, when BB was added to the music in session 2, the expected positive increase from .7 to 1.5 was achieved.

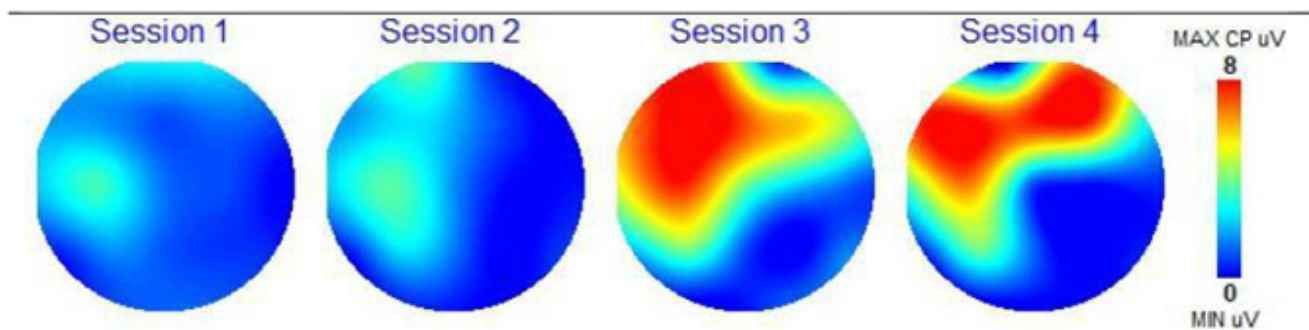
**Scalp Topography.** Figure 1 shows the scalp topography of the brain response for each session for Subject 1. In Session 1, we see that his otherwise calm brain became more attentive in the frontal area after brown noise, indicating thinking, but adding the BB in Session 2 moved the activity to the middle of the brain (location of the CZ point), indicating psychomotor or sensory processing. Condition 3 of music only created a very active brain, especially in the frontal areas. Condition 4 with the BB calmed down all but the frontal brain, a possible indication of the positive effects of BB.

**Bioenergy.** Subject 1's bioenergy rose after listening to brown noise plus BB from 22011 area and 94% symmetry to 23325 area and 94% symmetry. Listening to music plus brown noise plus BB caused an increase to 25205 area and 94% symmetry.

### Subject 2

**State CZ Theta Beta Assessment Scores.** Subject 2 began with a control score of 2.3, which lowered dramatically to 1.5 when BB was introduced to the brown noise. In the second session, the number lowered again from 2.6 to 2.5 when BB was introduced to the music.

**State F3/F4 Alpha Assessment Score.** Subject 2 be-



**Figure 2.** Scalp Topography of Brain Response: Subject 2.

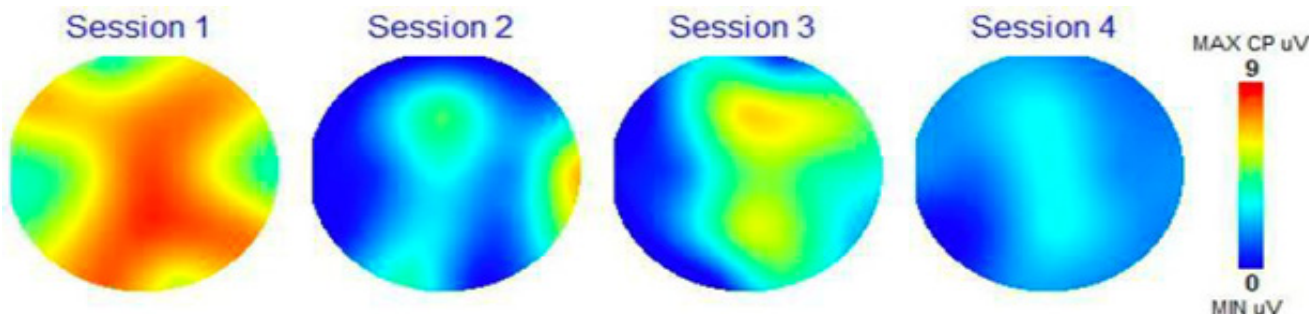
gan with a control score of 0.5, which expectedly rose to 0.9 when BB was added to the brown noise. When BB was added to the music in session 2, again, the expected positive increase from 1.0 to 1.1 was achieved.

**Scalp Topography.** Figure 2 shows scalp topography for each session for Subject 2. The brain of Subject 2 became slightly more attentive after adding BB in Session 2 in the area of sensorimotor integration. There was not much overall activity in response to the first two brown noise Conditions. The music in Sessions 3 and 4 seems to have had a profound effect on the brain of this subject in the left and temporal areas. These brain regions correspond to attention, motor planning, working and verbal memory, and sensorimotor integration. Adding the BB increased attention in the right frontal lobe area, which is related to motor planning and emotional expression.

**Bioenergy.** Subject 2’s bioenergy rose after listening to brown noise and BB from the 20741 area and 94% symmetry to the 20741 area and 93% symmetry. Listening to music plus brown noise plus BB caused an increase to 20283 area and a slight decrease in symmetry to 92%.

### Subject 3

**State CZ Theta Beta Assessment Scores.** Subject 3 began with a control score of 1.8, which lowered dramatically to 1.0 when BB was introduced to the brown noise. In the second session, the number lowered again from 1.4 to 1.3 when BB was introduced to the music.



**Figure 3.** Scalp Topography of Brain Response: Subject 3.

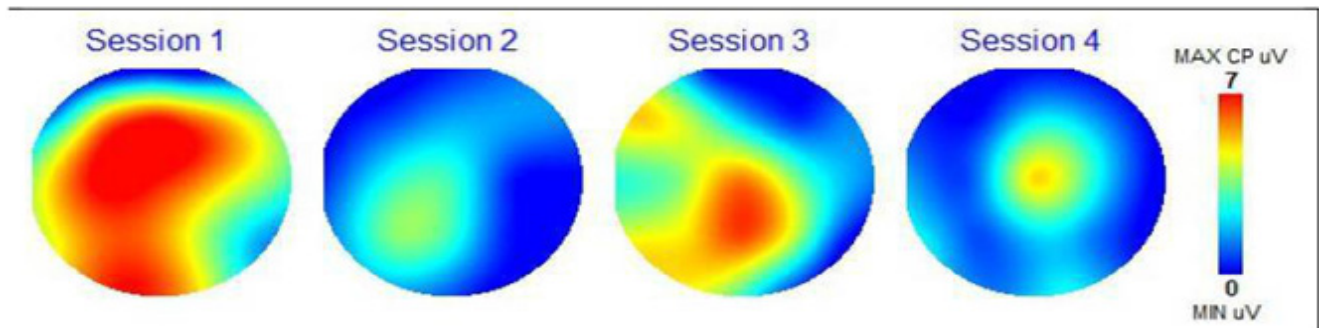
**State F3/F4 Alpha Assessment Score.** Subject three began with a control score of 1.2 which rose to 1.4 when BB were added to the brown noise. When BB were added to the music in session 2, the expected positive increase from 0.4 to 0.9 was achieved.

**Scalp Topography.** Figure 3 shows the scalp topography of the brain response for each session for Subject 3. It can be noted that after listening to Condition 1, her brain was aroused almost all over, indicating some level of agitation. After listening to Condition 2, the brown noise plus BB, her brain calmed down. After listening to Condition 3, the music track with brown noise, her brain became somewhat active, but not excessively, indicating that some memories were slightly activated (the top central yellow region) and that there was some cognitive processing (as shown by the bottom yellow region). After listening to Condition 4, the music track with brown noise and BB, her brain calmed down.

**Bioenergy.** Subject 3’s bioenergy rose after listening to brown noise and BB from 18909 area and 87% symmetry to 22289 area and 93% symmetry. Listening to music plus brown noise plus BB caused an increase to 20932 area and symmetry to 93%.

### Subject 4

**State CZ Theta Beta Assessment Scores.** Subject 4 began with a control score of 1.0, which lowered to 0.9 when BB were introduced to the brown noise. In the second session, the number did not decrease, but rose



**Figure 4.** Scalp Topography of Brain Response: Subject 4.

from 0.9 to 1.5 when BB were introduced to the music. The unexpected increase may be attributed to processing of memories. Adding BB increased her bioenergy significantly.

**State F3/F4 Alpha Assessment Score.** Subject 4 began with a control score of 1.1, which rose to 1.4 when BB was added to the brown noise. When BB was added to the music in session 2, again, the expected positive increase from 1.1 to 1.8 was achieved.

**Scalp Topography.** Figure 4 shows the scalp topography of Subject 4 for each session. It can be noted that after listening to Condition 1, brown noise, her brain was aroused almost all over, indicating some level of agitation. After listening to Condition 2, the brown noise plus BB, her brain relaxed quite a bit. After listening to Condition 3, the music track with brown noise, her brain became active in the central lower central region of the brain, a region performing cognitive processing. After listening to Condition 4, the music track with brown noise and BB, her brain calmed down further, with the middle of the brain slightly active, a region performing sensorimotor integration.

**Bioenergy.** Subject 4's bioenergy rose after listening to brown noise and BB from 13521 area and 65% symmetry to 18728 area and 915% symmetry. Listening to music plus brown noise plus BB caused an increase to 19927 area and symmetry to 94%.

## Menlascan

The Menlascan results provided measurements of the cardiovascular system and microcirculation. The most important results here are the improvement of cardiovascular and microcirculation scores as the ANS is prone to rapid changes with emotions. Subject 1 had the highest microcirculation score with Condition 2, brown noise and BB, and an increased cardiovascular score from Condition 4, music and BB (although just the control musical track increased cardiovascular as well). For subject 2, there was no improvement with Condition 2, brown noise, and BB. Condition 4, music, and BB increase both

the cardiovascular and microcirculation score.

For subject 3, our introverted subject, we see the least effect, with both Condition 1, brown noise and Condition 2, brown noise and BB, increasing only cardiovascular score, and Condition 4, music and BB providing only a mild cardiovascular improvement. In subject 4, there is a mild improvement only in cardiovascular after Condition 2, brown noise and BB, Condition 3 and Condition 4.

## DISCUSSION

In conclusion, Subject 1 became more attentive after Session 2 and Session 4, a possible indication of the positive effects of BB. Additionally, the brain of this subject became calmer after Session 4, a possible additional benefit of combining BB with music. Subject 1 had the highest microcirculation score with Session 2, brown noise and BB, and an increased cardiovascular score from Session 4, music and BB (although just the control musical track increased cardiovascular as well). These results agree with a personality that is conscientious and open.

Subject 2 became more attentive after Session 2 and had a more positive mood. Adding BB to brown noise and to music with brown noise seems to have helped this subject to be more present and have a more positive mode of processing information. The cardiovascular and microcirculation results were unremarkable. Overall, this subject has an excellent cardiovascular system. These results are consistent with the personality of this subject, which is very stable emotionally, with tendencies toward agreeableness and openness. After listening to the music track with brown noise, Subject 3's brain became somewhat active but not excessively, indicating that some memories were slightly activated.

After listening to the music track with brown noise and BB, her brain calmed down. A notable change that occurred when comparing before and after listening to Condition 2, brown noise and BB, is a decrease in microcirculation score that is unexpected. Also, unexpectedly, after listening to brown noise with BB, the cardiovascular score dropped as well. However, when Subject 3 came

to the lab the next day (day 2), her microcirculation and cardiovascular scores had improved, possibly from the effects of the BB. After listening to Condition 3, music with brown noise, the only change is a decrease in microcirculation score. Maybe she did not like the music? This subject is more of an introvert than an extrovert. Perhaps here we see the interaction of this quality, and the above results are related to this feature of her personality?

After listening to Condition 2, the brown noise and BB, Subject 4's brain relaxed quite a bit. The same happened when listening to Condition 4, music plus brown noise and BB. She has a positive processing brain (F3/F4 scores), which has become even more so after adding BB. Subject 4's Menlscan scores did not change much after listening to brown noise, with the exception of the cardiovascular score going down. However, this score improved after listening to Condition 2, brown noise with BB. After listening to Condition 4, music plus brown noise with BB, both her microcirculation and cardiovascular scores improved. BB seems to be enhancing whatever this subject hears. Subject 4 has strong tendencies toward Agreeableness and Conscientiousness. Maybe she did not like brown noise alone, but she liked the music, which mitigated the effect of the brown noise. Adding BB seems to have the effect of increasing this subject's scores.

Based on these results, all four recipients responded positively to therapeutic relaxation from listening to BB. For the most part, they left the lab feeling better and more relaxed than when they arrived, per our data and their own BMIS self-assessment—especially after BB was added to relaxation music. Given their individual preferences and needs, the Sponsor would recommend Alpha-Theta relaxation BB music as a form of meditation for Subjects 1, 3, and 4. It is best to listen to music for 10 minutes a day, and headphones must be worn. The best times are during morning or evening meditation practice times or in the afternoon for rest and recharge or integration of a busy day. Subjects 1, 3, and 4 would benefit from Delta BB sleep tracks, which are best listened to before sleep. And subject two would benefit from an active meditation, such as an Alpha-Theta BB walking tracks. Subject 2 would also benefit from Alpha-Theta BB tracks for creativity as he plans the second chapter of his life in retirement. Subject 3 would also find support for their menopausal lack of focus and disorganization with Beta BB focusing tracks. These recommendations essentially lay the framework for future studies with large sample sets of individuals, consistently using the BB tracks 10 minutes a day, Monday through Friday, for a period of six weeks. A home measurement device to measure the brain would need to be employed, as well as self-assessment questionnaires. There is particularly the question of how

menopausal women would respond to BB, given the hormonal component of the response to BB (Tobias, 1965).

The Sponsor chose a within-subject design to specifically test all independent control variables (noise, noise and BB, music, music, and BB) on all subjects, wanting to know if adding the BB into the exact same condition would provide any differences at all. As it happens, it did. In order to make sure that each condition was cleanly measured, we gave enough time for participants to return to baseline conditions, in addition to having part one and part two on two different days, but it is important to remember that the brain always changes and a new baseline had to be established for each experiment. Either way, four subjects are not enough to conduct statistical analysis or to do between-subject comparisons. What this study hopes to illustrate is that it is important to begin to develop protocols for studying BB so that larger studies can be conducted and their results can be compared.

The scalp topography maps illustrate the impact of the four auditory conditions on the electrical activity of the brain, changing its activity in response to the control state. In most instances, we are seeing a calmer brain when BB is added to the auditory condition. The CZ Theta Beta scores and F3/F4 Alpha scores presented a clear path toward observing the impact of the BB conditions on the specific frequency bands in the brain. Here, we are able to trace the changes in the brainwaves as they respond to different conditions. Although the sample set is small, 14 out of 16 measurements were as expected. This is a clear indication that this biometric is a strong choice for further studies with larger sample sets.

Overall, there is a mild increase in relaxation metrics such as cardiovascular and microcirculation scores, and there is not enough data to be conclusive. Bioenergy also improved for each subject. The Sponsor hopes to model an excellent method for studying the effects of BB on the cardiovascular system, but a larger sample size is needed for any true narrative to be discovered.

As regards the circadian rhythms component of the experiment, there was no way to discern a difference between the morning and afternoon data because they were experiencing different conditions. In fact, the design of the experience was such that everyone did the same thing at the same time for the express purpose that there be no difference in the data. Accounting for circadian rhythm is an important and suggested protocol for testing stimulation therapies, including BB (Atwater, 2001; Rossi, 1986; Shannahoff-Khalsa, 1991; Webb & Dube, 1981).

Given the research, we would expect to see that the introverted subject is less affected than the extroverted subjects (Chaieb et al., 2015; Stelmack et al., 1993), and



we have hypothesized a potential difference, but again, there is not enough data to come to a full conclusion. Either way, the Sponsor wants to model that this data should be included in every BB study, given the research that introversion and extroversion are pertinent factors (Chaieb et al., 2015). There is a growing field of personality assessment and music preferences, indicating that these factors are of importance (Anderson et al., 2021; Rentfrow et al., 2011). A similar study with a greater number of participants is suggested.

## IMPLICATIONS AND APPLICATIONS

The results of the present case study are encouraging. Further study into brainwave response to BB can contribute to potential therapeutic applications. It is recommended that further research be performed using different ranges of BB, varying amounts of exposure time, and a combination of multiple frequencies of BB to identify the most effective applications.

## CONCLUSION

The aim of this case study is to assess the effects of adding BB to music and to brown noise on the brain, bioenergy, and physiology of four study participants who were seeking relief from stress and/or relaxation. As seen in the scalp topography maps and the cardiovascular data in particular, each participant had very different responses to the four auditory conditions, yet data from the brain activity of all four participants showed in visual and numerical representation that the effects of BB were deeply embedded within the mind. All four study participants experienced an improvement in brain function and had a calmer brain after adding BB to brown noise or to music plus brown noise. Most also showed an improvement in microcirculation or cardiovascular score after listening to music, plus brown noise and BB. Since the BB was not audible, these effects could not be attributed to the placebo effect.

Listening to BB has been shown to induce synchronization of the brain hemispheres (Solca et al., 2016), and BB helps us to study or to affect cognitive brain function (Becher et al., 2015; Beauchene et al., 2016; Garcia-Argibay et al., 2019). When BB is used in a well-researched, conscious, evidence-based manner, there is a large amount of evidence showing that BB can be helpful in the categories of sleep (Bang et al., 2019; Gantt et al., 2017; Jirakittayakorn & Wongsawat, 2018; Lovati et al., 2019), anxiety (Garcia-Argibay et al., 2019; Isik et al., 2017), stress (Gantt et al., 2017), brain function (Gao et al., 2014; Reedijk et al., 2015), attention/cognition (Axelsen et al., 2020; Colzato, Barrone et al., 2017; Garcia-Argibay et al., 2019; Lim et al.,

2018), memory (Colzato, Steenbergen, & Sellaro, 2017; Gálvez et al., 2018; Lim et al., 2018); nervous system (Da Silva Júnior et al., 2020), trance/meditation (Jirakittayakorn & Wongsawat, 2018; Perales et al., 2019), and as an analgesic (Garcia-Argibay et al., 2019; Gkolias et al., 2020; Perales et al., 2019). Gao et al. (2014) specifically suggested that treatments to improve clarity, focus, and sleep, deepen meditation relaxation, increase working memory and episodic memory, and support ADHD may be the proper application of this tool. In addition, they discussed Theta as a possible antidote for the Beta overwhelm that frequently occurs in patients with schizophrenia and depression (Krasnoff, 2021).

There are still many BB studies that show inconclusive or no effects (López-Caballero & Escera, 2017; Lovati et al., 2019; Munro & Searchfield, 2019; Perez et al., 2020; Solcá et al., 2016). This relatively new research field is still determining its parameters. Inconclusive studies could possibly be the result of selecting the wrong brainwave for the wrong task. Theta brainwaves are expected to induce relaxation but not increase focus, and we see Pluck and López-Águila (2019) conducted a controlled, double-blind experiment to explore the effect of Theta (6 Hz) BB on cognitive fluency and fear. Beta brainwaves would have been a more expected choice for this study. In other studies, such as López-Caballero and Escera (2017), we see a usage time of 3 minutes for the BB when research tells us that we need a minimum of 8 minutes (Garcia-Argibay et al., 2019). Inconclusive and negative result studies are essential for determining the parameters of this technology. What was once the main theory that BB operates through the process of entrainment is now a discussion about stochastic resonance, brain regulation, the RAS, and neurotransmitters (Krasnoff, 2021). These are key research directions that will benefit the field of BB.

Lastly, it should be remembered that each auditory brain is different, representing the sum total of an individual's life experiences (Kraus, 2021). The auditory brain is a living system that teaches itself how to interpret sound and how to hear that sound with each afferent/efferent loop in the auditory pathway we call hearing (Kraus, 2021). Therefore, no two brains will respond the same to any auditory condition. What this means is that each individual must be individually diagnosed, assessed, and treated when it comes to sound. A relaxation track for one individual might be a lullaby, and for another individual, a heavy metal group like Metallica. In this pilot study, we can see that brain activity responds differently to all auditory conditions, which underlines that individual responses must be taken into account. Large sample sets help to offset these individual differences. The results of the study are encouraging in terms of developing

musical products incorporating BB to affect human neural rhythms and corollary states of consciousness. This research represents a bridge between sound technology and neuroscience.

**Strengths.** The strengths of this case study include the consistency of the time spent on data gathering. All testing was done at the same time of day so that all participants could account for circadian rhythm. The BB were inaudible, which eliminated the placebo effect, and sequenced into the experiment such that we could immediately see whether there was a change or not. The study was double-blinded and was conducted with two control conditions.

**Limitations.** Limitations of this case study included the small number of participants – four. A small sample size may make it difficult to determine if a particular outcome can be generalized to a larger population. There was a geographic limitation of the sample since all participants were from the same area near the research laboratory site. Since study participants were not confined to the laboratory during the duration of the study, external conditions could have influenced their response to the auditory stimulation.

These results are encouraging and warrant further research with more participants and different frequencies of BB and different musical tracks. Further study into the use of binaural beats for augmenting brainwaves can help diversify the knowledge about potential therapeutic uses. Investigations using large sample sets, different ranges of binaural beats, varying amounts of exposure time, a combination of multiple frequencies of beats, different carrier frequencies, and more sophisticated statistical analysis (Atwater, 2001; Chaieb et al., 2015; da Silva Júnior et al., 2020; Gkolias et al., 2020; Huang et al., 2008; Solcá et al., 2016) are recommended to identify the most effective use of such strategies.

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## AUTHOR CONTRIBUTIONS

**Elizabeth Krasnoff, Ph.D.:** Sponsor - Writing – Editing – Supervision – Auditory software – Method - Conceptualization.

**Gaétan Chevalier:** Principal Investigator, Research Director

### Conflict of Interest

Elizabeth Krasnoff, Ph.D discloses a conflict of interest. She uses binaural beats in her sound medicine practice. She also makes and sells binaural beats products.

### Data Availability

Data Files available on Figshare: <https://figshare.com/s/cfc3ca4e38bc88008ad4> (General link to use prior to publication)

## REFERENCES

- Abdullah, N. I., Bakar, O. C., Omar, A., Murat, Z. H., & Selamat, M. I. (2014, December). Bioenergy frequency measurement of stressed and non-stressed individuals using resonant field imaging (RFI) frequency counter. In *2014 IEEE Conference on Biomedical Engineering and Sciences (IECBES)* (pp. 667-671). IEEE.
- Aldrich, B., Goins, H., & Anwar, M. (2021, September). Interpreting keystrokes to ascertain human mood. In *2021 Third International Conference on Transdisciplinary AI (TransAI)* (pp. 112-115). IEEE. <https://doi.org/10.1109/TransAI51903.2021.00028>
- Anderson, I., Gil, S., Gibson, C., Wolf, S., Shapiro, W., Semerci, O., & Greenberg, D. M. (2021). "Just the way you are": Linking music listening on Spotify and personality. *Social Psychological and Personality Science*, 12(4), 561–572. <https://doi.org/10.1177/1948550620923228>
- Atwater, F. H. (2001). Binaural beats and the regulation of arousal levels. *Proceedings of the TANS*, 1(11-2), 1-17. <https://archive.org/details/tmi-research-regulation-of-arousal-levels>
- Avan, P., Giraudet, F., & Büki, B. (2015). Importance of binaural hearing. *Audiology and Neurotology*, 20(1), 3-6. <https://doi.org/10.1159/000380741>
- Axelsen, J. L., Kirk, U., & Staiano, W. (2020). On-the-spot binaural beats and mindfulness reduces the effect of mental fatigue. *Journal of Cognitive Enhancement*, 4(1), 31-39. <https://doi.org/10.1007/s41465-019-00162-3>
- Bakaeva, Z. V., Shumov, D. E., Yakunina, E. B., Starshinov, Y. P., Sveshnikov, D. S., Torshin, V. I., ... & Karpov, V. I. (2022). The influence of music with the binaural beat effect on heart rate during daytime sleep in humans. *Neuroscience and Behavioral Physiology*, 52(2), 218-

222. DOI 10.1007/s11055-022-01227-1
- Bang, Y. R., Yun Choi, H., & Yoon, I. Y. (2019). Minimal effects of binaural auditory beats for subclinical insomnia: A randomized double-blind controlled study. *Journal of Clinical Psychopharmacology*, 39(5), 499-503. <https://doi.org/10.1097/JCP.0000000000001097>
- Beauchene, C., Abaid, N., Moran, R., Diana, R. A., & Leonessa, A. (2016). The effect of binaural beats on verbal working memory and cortical connectivity. *Journal of Neural Engineering*, 14(2), Article 026014. <https://doi.org/10.1088/1741-2552/aa5d67>
- Becher, A. K., Höhne, M., Axmacher, N., Chaieb, L., Elger, C. E., & Fell, J. (2015). Intracranial electroencephalography power and phase synchronization changes during monaural and binaural beat stimulation. *European Journal of Neuroscience*, 41(2), 254-263. <https://doi.org/10.1111/ejn.12760>
- Blum, D., & Jamet, A. (2022). Can brown noise turn off your brain? *New York Times*. <https://www.nytimes.com/interactive/2022/09/23/well/mind/brown-noise.html>
- Buecker, S., Maes, M., Denissen, J. J., & Luhmann, M. (2020). Loneliness and the Big Five personality traits: A meta-analysis. *European Journal of Personality*, 34(1), 8-13. <https://doi.org/10.1002/per.2229>
- Chaieb, L., Wilpert, E. C., Reber, T. P., & Fell, J. (2015). Auditory beat stimulation and its effects on cognition and mood states. *Frontiers in Psychiatry*, 6, Article 70. <https://doi.org/10.3389/fpsy.2015.00070>
- Colzato, L. S., Barone, H., Sellaro, R., & Hommel, B. (2017). More attentional focusing through binaural beats: Evidence from the global-local task. *Psychological Research*, 81, 271-277. <https://doi.org/10.1007/s00426-015-0727-0>
- Colzato, L. S., Steenbergen, L., & Sellaro, R. (2017). The effect of gamma-enhancing binaural beats on the control of feature bindings. *Experimental Brain Research*, 235, 2125-2131.
- da Silva Júnior, M., de Freitas, R.C., da Silva, W.W.A., Rodrigues, M.C.A., Conde, E.F.Q., dos Santos, W.P. (2020). Using Artificial Neural Networks on Multi-channel EEG Data to Detect the Effect of Binaural Stimuli in Resting State. In G. Naik, (eds) Biomedical signal processing. Series in BioEngineering. 99-136. Springer. [https://doi.org/10.1007/978-981-13-9097-5\\_6](https://doi.org/10.1007/978-981-13-9097-5_6)
- Deshpande, P. B., Korotkov, K., & Kowall, J. P. (2016). Bioenergy measurements for predictive medical diagnosis. *Journal of Consciousness Exploration & Research*, 7(2), 1-10.
- Dove, H. W., & Moser, L. F. (Eds.). (1839). *Repertorium der Physik: Bd.(1839) IX. Akustik von A. Röber und F. Strehle. X. Theoretische Optik von [G.] Rädicke. XI. Meteorologie [von HW Dove (Vol. 3). Veit & Company.*
- Fiske, D. W. (1949). Consistency of the factorial structures of personality ratings from different sources. *The Journal of Abnormal and Social Psychology*, 44(3), 329-344. <https://doi.org/10.1037/h0057198>
- Flexer, A., Lallai, T., & Rašl, K. (2021). On evaluation of inter-and intra-rater agreement in music recommendation. *Transactions of the International Society for Music Information Retrieval*, 4(1), 182+ <https://doi.org/10.5334/tismir.107>
- Gálvez, G., Recuero, M., Canuet, L., & Del-Pozo, F. (2018). Short-term effects of binaural beats on EEG power, functional connectivity, cognition, gait and anxiety in Parkinson's disease. *International Journal of Neural Systems*, 28(05), Article 1750055. <https://doi.org/10.1142/S0129065717500551>
- Gantt, M. A., Dadds, S., Burns, D. S., Glaser, D., & Moore, A. D. (2017). The effect of binaural beat technology on the cardiovascular stress response in military service members with postdeployment stress. *Journal of Nursing Scholarship*, 49(4), 411-420. <https://doi.org/10.1111/jnu.12304>
- Gao, X., Cao, H., Ming, D., Qi, H., Wang, X., Wang, X., ... & Zhou, P. (2014). Analysis of EEG activity in response to binaural beats with different frequencies. *International Journal of Psychophysiology*, 94(3), 399-406. <https://doi.org/10.1016/j.ijpsycho.2014.10.010>
- Garcia-Argibay, M., Santed, M. A., & Reales, J. M. (2019). Efficacy of binaural auditory beats in cognition, anxiety, and pain perception: A meta-analysis. *Psychological Research*, 83(2), 357-372. <https://doi.org/10.1007/s00426-018-1066-8>
- Gkolias, V., Amaniti, A., Triantafyllou, A., Papakonstantinou, P., Kartsidis, P. et al., (2020). Reduced pain and analgesic use after acoustic binaural beats therapy in chronic pain-A double-blind randomized control cross-over trial. *European Journal of Pain*, 24(9), 1716-1729. <https://doi.org/10.1002/ejp.1615>
- Grover Jr, F., Weston, J., & Weston, M. (2017). Acute effects of near infrared light therapy on brain state in healthy subjects as quantified by qEEG measures. *Photomedicine and Laser Surgery*, 35(3), 136-141. <https://doi.org/10.1089/pho.2015.4036>
- Hansen, J. N., & Lieberman, J. A. (2014). Studies of a human bioenergy field using a torsion pendulum balance. *Journal of Alternative and Complementary Medicine*, 20(5), A31-A31. <https://doi.org/10.1089/acm.2014.5077.abstract>
- Huang, T. L., & Charyton, C. (2008). A comprehensive review of the psychological effects of brainwave entrainment. *Alternative Therapies in Health and Medicine*, 14(5), 38-50.
- Isik, B. K., Esen, A., Büyükerkmen, B., Kilinç, A., & Men-

- ziletoglu, D. (2017). Effectiveness of binaural beats in reducing preoperative dental anxiety. *British Journal of Oral & Maxillofacial Surgery*, 55(6), 571–574. <http://dx.doi.org/10.1016/j.bjoms.2017.02.014>
- Jirakittayakorn, N., & Wongsawat, Y. (2017). Brain responses to a 6 Hz binaural beat: Effects on general theta rhythm and frontal midline theta activity. *Frontiers in Neuroscience*, 11, Article 365. <https://doi.org/10.3389/fnins.2017.00365>
- Joffe, D., Oakley, D. S., Lucini, F. A., & Palermo, F. X. (2021). Measurements of EEG alpha peak frequencies over the lifespan: Validating target ranges on an in-clinic platform. *bioRxiv*, 2021-10. <https://doi.org/10.1101/2021.10.06.463353>
- Kachur, A., Osin, E., Davydov, D., Shutilov, K., & Novokshonov, A. (2020). Assessing the Big Five personality traits using real-life static facial images. *Scientific Reports*, 10(1), 1-11. <https://doi.org/10.1038/s41598-020-65358-6>
- Korotkov, K. G., Matravers, P., Orlov, D. V., & Williams, B. O. (2010). Application of electrophoton capture (EPC) analysis based on gas discharge visualization (GDV) technique in medicine: a systematic review. *Journal of Alternative and Complementary Medicine*, 16(1), 13-25. <https://doi.org/10.1089/acm.2008.0285>
- Krasnoff, E. W. (2021). Effects of auditory binaural beats on consciousness and the human nervous system: A transdisciplinary review of the evidence. California Institute of Integral Studies ProQuest Dissertations Publishing, 2021.28491011. <https://doi.org/10.1016/j.brs.2021.10.365>
- Kraus, N. (2021). *Of sound mind: How our brain constructs a meaningful sonic world*. MIT Press. <https://doi.org/10.7551/mitpress/13606.001.0001>
- Lim, J. H., Kim, H., Jeon, C., & Cho, S. (2018). The effects on mental fatigue and the cognitive function of mechanical massage and binaural beats (brain massage) provided by massage chairs. *Complementary Therapies in Clinical Practice*, 32, 32-38. <https://doi.org/10.1016/j.ctcp.2018.04.008>
- Lakatos, P., Karmos, G., Mehta, A. D., Ulbert, I., & Schroeder, C. E. (2008). Entrainment of neuronal oscillations as a mechanism of attentional selection. *Science*, 320( 5872), 110-113. <https://doi.org/10.1126/science.1154735>
- López-Caballero, F., & Escera, C. (2017). Binaural beat: A failure to enhance EEG power and emotional arousal. *Frontiers in Human Neuroscience*, 11, Article 557. <https://doi.org/10.3389/fnhum.2017.00557>
- Lovati, C., Freddi, A., Muzio, F., & Pantoni, L. (2019). Binaural stimulation in migraine: Preliminary results from a 3-month evening treatment. *Neurological Sciences*, 40(1), 197-198. <https://doi.org/10.1007/s10072-019-03803-9>
- Mammadov, S. (2022). Big Five personality traits and academic performance: A meta-analysis. *Journal of Personality*, 90(2), 222-255. <https://doi.org/10.1111/jopy.12663>
- Mayer, J. D., & Gaschke, Y. N. (1988). The experience and meta-experience of mood. *Journal of Personality and Social Psychology*, 55, 102-111. <https://doi.org/10.1037/0022-3514.55.1.102>
- Munro, B. A., & Searchfield, G. D. (2019). The short-term effects of recorded ocean sound with and without alpha frequency binaural beats on tinnitus perception. *Complementary Therapies in Medicine*, 44, 291-295. <https://doi.org/10.1016/j.ctim.2019.05.005>
- Nugraha, E., Wibowo, R., & Firmansyah, H. (2020, February). Mood states and game performance in invasion game activities: A correlation study among elementary school students. In *4th International Conference on Sport Science, Health, and Physical Education (ICSSHPE 2019)* (pp. 95-98). Atlantis Press. <https://doi.org/10.2991/ahsr.k.200214.027>
- Oakley, D. S., Fosse, K., Gerwick, E., Joffe, D., Oakley, D. A. et al., (2021). P300 parameters over the lifespan: Validating target ranges from an in-clinic platform. *bioRxiv*, 2021-10. <https://doi.org/10.1101/2021.10.25.465715>
- Oster, G. (1973). Auditory beats in the brain. *Scientific American*, 229(4), 94-103. <https://doi.org/10.1038/scientificamerican1073-94>
- Perales, F. J., Riera, L., Ramis, S., & Guerrero, A. (2019). Evaluation of A VR system for pain management using binaural acoustic stimulation. *Multimedia Tools and Applications*, 78, 32869–32890. <https://doi.org/10.1007/s11042-019-07953-y>
- Perez, H. D. O., Dumas, G., & Lehmann, A. (2020). Binaural beats through the auditory pathway: From brainstem to connectivity patterns. *Eneuro*, 7(2), Article ENEURO.0232-19.2020. <https://doi.org/10.1523/ENEURO.0232-19.2020>
- Plessen, C. Y., Franken, F. R., Ster, C., Schmid, R. R., Wolfmayr, C. et al., (2020). Humor styles and personality: A systematic review and meta-analysis on the relations between humor styles and the Big Five personality traits. *Personality and Individual Differences*, 154, Article 109676. <https://doi.org/10.1016/j.paid.2019.109676>
- Pluck, G., & López-Águila, M. A. (2019). Induction of fear but no effects on cognitive fluency by theta frequency auditory binaural beat stimulation. *Psychology & Neuroscience*, 12(1), 53-64. <https://doi.org/10.1037/pne0000166>
- Prakash, S., Chowdhury, A. R., & Gupta, A. (2015). Mon-

- itoring the human health by measuring the biofield "aura": An overview. *International Journal of Applied Energy Research*, 10, 27654-27658.
- Pratt, H., Starr, A., Michalewski, H. J., Dimitrijevic, A., Bleich, N., & Mittelman, N. (2010). A comparison of auditory evoked potentials to acoustic beats and to binaural beats. *Hearing Research*, 262(1-2), 34-44. <https://doi.org/10.1016/j.heares.2010.01.013>
- Reedijk, S. A., Bolders, A., Colzato, L. S., & Hommel, B. (2015). Eliminating the attentional blink through binaural beats: A case for tailored cognitive enhancement. *Frontiers in Psychiatry*, 6, Article 82. <https://doi.org/10.3389/fpsy.2015.00082>
- Rein, G. (1995). The in vitro effect of bioenergy on the conformational states of human DNA in aqueous solutions. *Acupuncture & Electro-Therapeutics Research*, 20(3-4), 173-180. <https://doi.org/10.3727/036012995816357005>
- Rentfrow, P. J., Goldberg, L. R., & Levitin, D. J. (2011). The structure of musical preferences: A five-factor model. *Journal of Personality and Social Psychology*, 100(6), 1139-1157. <https://doi.org/10.1037/a0022406>
- Roshani, B., Rezaei, M., Azadi, P., & Jalilian, A. (2019). The effect of binaural beat music on reducing anxiety and pain and increasing satisfaction of ophthalmic ambulatory surgery patients. *Journal of Kermanshah University of Medical Sciences*, 23(4), Article 99914. <https://doi.org/10.5812/jkums.99914>
- Rossi, E. L. (1986). Altered states of consciousness in everyday life: The ultradian rhythms. In B. Wolman & M. Ullman (Eds.), *Handbook of States of Consciousness* (pp. 97-132). Van Nostrand Reinhold.
- Royal Academy of Arts and Sciences. (2022). H.W. Dove (1803-1879). <https://dwc.kaw.nl/biografisch-apparaat/pmkaw/?pagetype=authorDetail&aId=PE00000016>
- Shannahoff-Khalsa, D. (1991). Lateralized rhythms of the central and autonomic nervous systems. *International Journal of Psychophysiology*, 11(3), 225-251. [https://doi.org/10.1016/0167-8760\(91\)90017-R](https://doi.org/10.1016/0167-8760(91)90017-R)
- Shapero, E. J., & Prager, J. P. (2020). ILF neurofeedback and alpha-theta training in a multidisciplinary chronic pain program. In H. W. Kirk (Ed.) *Restoring the Brain: Neurofeedback as an Integrative Approach to Health* (pp. 223-243). Routledge.
- Solcà, M., Mottaz, A., & Guggisberg, A. G. (2016). Binaural beats increase interhemispheric alpha-band coherence between auditory cortices. *Hearing Research*, 332, 233-237. <https://doi.org/10.1016/j.heares.2015.09.011>
- Stelmack, R. M., Campbell, K. B., & Bell, I. (1993). Extraversion and brainstem auditory evoked potentials during sleep and wakefulness. *Personality and Individual Differences*, 14(3), 447-453. [https://doi.org/10.1016/0191-8869\(93\)90314-S](https://doi.org/10.1016/0191-8869(93)90314-S)
- Tarrant, J. M., Raines, N., & Blinne, W. R. (2019). The effects of meditation on twin hearts on P300 values: A repeated measures comparison of nonmeditators and the experienced. *Integrative Medicine*, 18(2), 36-41.
- Thompson, S. P. (1877). XXXVI. On binaural audition. *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, 4(25), 274-276. <https://doi.org/10.1080/14786447708639338>
- Tobias, J. V. (1965). Consistency of sex differences in binaural-beat perception. *International Audiology*, 4(2), 179-182. <https://doi.org/10.3109/05384916509074132>
- Webb, W. B., and Dube, M. G. (1981). Temporal characteristics of sleep. In J. Valsiner (Ed.), *Handbook of Behavioral Neurobiology*, Vol. 4. (pp. 499-522). Springer.
- Waxenbaum, J. A., Reddy, V., & Varacallo, M. (2019). *Anatomy, autonomic nervous system*. StatPearls Publishing.



ESSAY

# A History of Scientific Approaches to Unidentified Anomalous Phenomena: Time to Rethink their Relegation to the Paranormal and Engage Seriously?

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## HIGHLIGHTS

The study of unidentified aerial phenomena (UAPs) has gradually outgrown its “paranormal” stigma to become a mainstream scientific topic.

## ABSTRACT

The topic of “Unidentified Anomalous Phenomena” (UAP) has historically been regarded with skepticism by the scientific community. After a period of relative openness and ambivalence in the 1950s and 60s, it eventually became generally categorized as a “paranormal” concern and dismissed as a legitimate focus of inquiry. However, the issue has risen to public prominence over recent years. As such, this paper argues UAP should be redeemed as a scientific topic and given the scrutiny that such a potentially important phenomenon merits. The focus here is not assessing the nature of UAP per se but simply to argue this is a valid topic that the scientific community has shied away from which deserves real consideration.

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## KEYWORDS

Extraterrestrial, government disclosure, paradigm, science, UAP, UFO.

## INTRODUCTION

Over the past several years, Unidentified Anomalous Phenomena (UAP) – previously/also known as Unidentified Flying Objects (UFOs) – have become an increasingly prominent concern in the public sphere. Relatedly, so have potential “extraordinary” explanations for such phenomena, including an extraterrestrial hypothesis (ETH), which suggests UAP may involve forms of non-human intelligence from elsewhere in the cosmos (Lomas, 2024). Until recently, the dominant response to this topic in various realms of authority and expertise – including scientific, military, intelligence, political, and media communities – has been skepticism and incredulity, at least

in public. Due to certain developments over the past few years, though, this attitude may be changing, at least in some quarters. However, many scientists seem to have remained strangely disinterested in the topic, often going beyond mere reasonable skepticism and into attitudes that could be regarded as anti-scientific, from indifference to an overweening certainty of “nothing to see.” However, given recent events, such attitudes are unreasonable and need revisiting. At the very least, the topic deserves serious and open-minded attention from the scientific community. This paper articulates this argument in two sections. The first explores the way science has historically treated the UAP topic, eventually relegating it to the category of the “paranormal.” The second part



then considers, in light of recent developments, whether UAP should *still* be treated as such.

Before we commence, one should note this article focuses on a North American context for various reasons, including (a) limiting its scope to a manageable amount, (b) since, of all world regions, this arguably has historically had the most UAP activity, and (c) this is my own context and area of expertise. However, contrary to some misconceptions, this is a genuinely worldwide phenomenon (Lomas, 2023). For example, in a Congressional UAP hearing in July 2023, journalist George Knapp submitted testimony regarding UAP investigations conducted by the USSR during the Cold War and stated that during a 10-year period, “thousands” of case files were accumulated, including 45 incidents in which “Russian warplanes engaged with UFOs, chased them, even shot at them” (Eberhart, 2023). Or take Latin America, of which The Washington Post reports at least four countries (Uruguay, Argentina, Chile, and Peru) have government programs that for decades have assessed UAP activity (McCoy, 2023), while others like Brazil likewise have an extensive history of sightings, with Vernet (2023) reporting that its Air Force has investigated 674 events just between 1954 and 2005. Even nations like China, which have been more secretive on this topic, have admitted to tracking the phenomenon, with an article in the South China Morning Post acknowledging that “China military uses AI to track rapidly increasing UFOs” (Chen, 2021). That said, not all countries have approached the issue in identical ways; it appears, for example, that authorities in Latin America have generally been more open compared to counterparts elsewhere (McCoy, 2023). Nevertheless, many of the trends observed in the US, as discussed here, pertain to other countries. With that in mind, we begin by considering the historical context in the US.

### UAP: The Historical Context

There have been reports of UAP going back decades and even centuries (see, e.g., Lomas & Case, 2023; Vallée, 2008). However, although these initially appear to have commanded scientific interest, this mainly dissipated in the late 1960s, especially following the influential Condon Report, which – per similar endeavors in preceding years – led authorities to declare that apparent UAP most likely had prosaic explanations. Thereafter, claims that some UAP are genuinely anomalous – e.g., extraterrestrial in origin – tended to be dismissed as “paranormal.” This first part explores these developments over five sections: (1) the difficulty of navigating this historical terrain; (2) early years of scientific engagement, characterized by a tension between interest in the topic yet also efforts to

downplay it; (3) the tendency, especially post-Condon, to treat UAP as a paranormal topic; (4) some scientific interest in UAP nevertheless persisting, and (5) legitimized engagement in topics adjacent to UAP.

### Navigating UAP History

Before briefly considering the history of UAP, it is worth reflecting on the very process of trying to reconstruct this story, which of all topics may be unrivaled in its elusive and uncertain nature. Crucially, there are at least three different narratives. First is the “official” account presented by the authorities themselves. “Authorities” are not a monolith, of course, with competing factions and agendas. Nevertheless, it is certainly legitimate to speak of authorities – encompassing key institutions of public life, especially political, military, intelligence, academic, and media communities – reaching a general consensus. In that respect, until very recently, authorities worldwide have tended to dismiss UAP as nothing more than prosaic natural (e.g., weather) or human-made (e.g., drones) phenomena. Crucially, though, this official narrative is not the only account of the phenomenon, and at least two others exist: the “concealed” and “revealed” stories. Essentially, the vast majority of information about this topic is highly classified, hidden behind vast, intricate walls of secrecy, and nearly entirely off-limits to the public (including academics like myself). Indeed, it is highly compartmentalized and restricted even to authority figures with the highest security clearances, so it probably cannot be known in its entirety by any one person. This is the “concealed” story. Crucially, though, between the official and concealed narratives is an enigmatic “revealed” account involving strands of the concealed story that have somehow found their way into the public domain, such as through investigative journalists or authority figures divulging information. This revealed story is the one accounts like mine generally aim to tell. However, it is very slippery and uncertain, a hall of mirrors of rumors and allegations that are often never fully substantiated. Thus, people are required to make judgment calls about the veracity of claims while never being fully certain of the true picture.

Consider, for example, the story that dominated this topic in the summer of 2023: allegations by David Grusch, an intelligence community whistleblower, that US authorities have maintained a secret UAP crash retrieval and reverse engineering program dating back at least to 1933 (Kean & Blumenthal, 2023). There is no way of knowing the truth of his claims at present. Significantly, though, the Intelligence Community Inspector General deemed his complaint “credible and urgent.” Moreover, Senator

Marco Rubio, Vice Chairman of the Senate Select Committee on Intelligence, said on June 26 that “many” other whistleblowers had corroborated Grusch’s claims, including people with “firsthand knowledge” of such programs. Similarly, Shellenberger et al. (2023, para. 2) reported “at least 30 other whistleblowers” had given such testimony to various authorities. What to make of such information? Given how his allegations have been treated by relevant figures, I personally believe his claims – extraordinary as they are – to be more likely true than false. Consider the new bipartisan proposals, introduced in July by Chuck Schumer, Majority Leader of the Senate, for a UAP Disclosure Act (U.S.C. S.2226, 2023). As reported in *The New York Times*, this would create “a commission with broad authority to declassify government documents about U.F.O.s and extraterrestrial matters, in an attempt to force the government to share all that it knows about unidentified phenomena” (Barnes, 2023). Strikingly, the legislation essentially reiterates Grusch’s claims, including defining “legacy program” (efforts to “collect, exploit, or reverse engineer technologies of unknown origin”). In the event, the provisions in the Act were significantly weakened when only minimal aspects were passed into law in December in the National Defense Authorization Act for the fiscal year 2024. Notably, resistance reportedly came from House Representatives with close ties to the very aerospace companies rumoured to have engaged in UAP reverse engineering efforts, and who would thus be affected by, and moreover motivated to oppose, the original legislation (Sharp, 2023). As Schumer (2023) himself posted on X, “It is an outrage that the House didn’t work with us on our UAP proposal for a review board [one of the most consequential aspects of the proposed legislation]. This means declassification of UAP records will be up to the same entities who have blocked and obfuscated their disclosure for decades. We will keep working to change the status quo”. Nevertheless, even in its stripped-back state, the NDAA still contains some remarkable UAP-related provisions and language, including requiring federal agencies to release “all records that most un-ambiguously and definitively pertain to unidentified anomalous phenomena, technologies of unknown origin, and non-human intelligence” (HR.2670, Sections 1841-1843; see Johnson, 2023). The key point here is that it seems highly unlikely that the Senate Majority Leader would make such public remarks, and especially propose such remarkable legislation, absent highly credible corroborating evidence or testimony. Hence me suggesting that Grusch’s claims may well, on balance, contain at least some truth.

However, I cannot be certain, of course; as such, this paper includes his allegations as *possibly* true – since, given their impact, it seems inappropriate to omit them

– while recognizing they may well not be and leaving people to draw their own conclusions. Even aside from these allegations, though, the revealed history that *has* already been generally accepted as factual is remarkable enough as we consider next.

### Recent UAP History

The modern UAP movement can generally be dated, notwithstanding Grusch’s claims of a crash retrieval program going back to the 1930s, to World War II, which saw a proliferation of strange aerial events observed by pilots that officials feared were a new form of weaponry (Hanks, 2023). A *New York Times* piece in 1944, for example, headlined “Floating mystery ball is new Nazi air weapon,” reported, “Airmen of the American Air Force report that they are encountering silver colored spheres in the air over German territory,” and that “The spheres are encountered either singly or in clusters. Sometimes they are semi-translucent.” American aviators described these “balls of fire” as “foo fighters” (from the French *feu*, meaning fire). *The Indianapolis Star*, for instance, reported how they “appear suddenly and accompany the plane for miles,” even at 300 mph, and yet – contrary to fears of these being weaponry – noted how “they don’t explode or attack us. They just seem to follow us like “will-o-the-wisps” (Wilson, 1945). Similarly, a raft of cigar-shaped objects reported over Scandinavia in 1946 – with more than 1,000 in Sweden alone – led US army intelligence to suspect the Russians had developed a secret weapon. Then, in 1947, sightings began to be reported in the mainland US, beginning on June 24<sup>th</sup>, when pilot Kenneth Arnold famously saw what he famously called nine “saucer-like things... flying like geese in a diagonal chainlike line” in Washington State (Roos, 2020). This was the catalyst for a new UFO “movement.” Within weeks, similar sightings were reported in 40 other states. This caused considerable concern for authorities, as recounted in a *New York Times* article titled “U.F.O files: The untold story” (Huyghe, 1979). At first, per the wartime sightings, these events were primarily interpreted through the lens of warfare. For example, Brigadier General Schulgen of Army Air Corps Intelligence requested the F.B.I.’s assistance “in locating and questioning the individuals who first sighted the so-called flying discs....” mainly because he worried that these “might have been by individuals of Communist sympathies with the view to causing hysteria and fear of a secret Russian weapon.”

Whatever the motives for investigating, from that point on, authorities began taking the issue seriously (Swords & Powell, 2012). Moreover, they swiftly appear to have realized the phenomenon was genuine, as articulat-



ed in a famous memo sent to Schulgen in September 1947 by Lieutenant General Twining (1947), Army Chief of Staff, stating “the phenomenon reported is of something real and not visionary or fictitious,” that the objects appeared to be disc-shaped, “as large as man-made aircraft,” and “controlled either manually, automatically or remotely” (Zabel, 2021). At Twining’s urging, in early 1948, the Air Force established Project Sign, an intelligence operation based at Wright-Patterson Air Force Base, to examine the issue. It was subsequently reported – initially by Air Force UFO investigator Edward Ruppelt (1956) – that in 1948, the project submitted an unofficial “Estimate of the Situation,” classified “Top Secret,” that UAP were extraterrestrial in origin. However, when the report reached the Air Force Chief of Staff, General Vandenberg, he rejected it, ostensibly for lack of proof. However, his resistance may have run even deeper: Swords (2000) records that “elements of very high rank in the Pentagon” would not actually *accept* an ETH for UAP, with this lack of support resulting in the breakup of the Sign and the alleged destruction of all (with perhaps an exception) copies of the Estimate.

Moreover, this negativity towards the ETH, and the topic generally, was carried into Sign’s successor, Project Grudge, launched in 1949. Its ethos was later revealed by astronomer J. Allen Hynek (1977), who was a consultant to both projects. His recollection was of two competing schools of thought in the Air Force. One, mostly based at Wright-Patterson, thought UAP were most likely extraterrestrial. The second, which constituted a majority at the Pentagon, regarded the topic as “nonsense” (Swords, 2000, p. 43). Crucially, the Air Force’s Scientific Advisory Board sided with the latter, as did Hynek himself at the time, who recalled, “my interim reports helped the transformation of Project Sign into the extremely negative Project Grudge, which took as its premise that UFOs simply *could not be*. I tried hard to find astronomical explanations for as many cases as I could, and in those that I couldn’t, I reached to draw out as many natural explanations as possible. Sometimes, I stretched too far. Clearly, I, too, thought at the time that UFOs were just a lot of nonsense. I enjoyed the role of debunker” (p. 17, italics in original). Thus, Project Grudge was engineered, as Haines (1999) puts it, “to alleviate public anxiety over UFOs via a public relations campaign designed to persuade the public that UFOs constituted nothing unusual or extraordinary” (p. 68). Indeed, the Air Force announced Grudge’s termination that same year, in part due to fears the very fact of Air Force interest would encourage people to believe in UFOs and contribute to the “war hysteria” (already a concern, given Cold War tensions). Thus, as far as the public was concerned, the Air Force was no longer

interested in UAP – even though, behind the scenes, it continued to collect reports through regular intelligence channels, with a dramatic sighting at the Army Signal Corps radar center in Fort Monmouth in 1951 leading to the reactivation of Grudge, which was repurposed and re-named as Project Blue Book in 1952. Similarly, while the CIA concluded that “since there is a remote possibility that they may be interplanetary aircraft, it is necessary to investigate each sighting,” it recommended it conceal its interest from the public and the media “in view of their probable alarmist tendencies.”

Nevertheless, sightings continued and indeed escalated, exemplified by a “UFO mania” in 1952 (Roos, 2020), which included a surge of observations in Washington DC in July so dramatic they generated headlines like “Saucers Swarm Over Capital” and “Jets Chase D.C. Sky Ghosts.” However, these too were downplayed. On the recommendations of the CIA, a scientific panel headed by physicist Howard Robertson was established to examine the issue. However, this was criticized as perfunctory, meeting for just 12 hours and reviewing only 23 cases out of 2,331 Air Force cases on record. Even so, there were intriguing elements: a presentation by Major Fournet – who had coordinated UFO affairs for the Pentagon for over a year – “showed how he had eliminated each of the known and probable causes of sightings, leaving him “extra-terrestrial” as the only one remaining in many cases” (Durant, 1953). However, despite his observations, “The Panel concluded unanimously that there was no evidence of a direct threat to national security in the objects sighted,” and that they did not find “any evidence that related the objects sighted to space travelers.” Moreover, the committee argued that continued openness to the phenomenon by authorities might threaten “the orderly functioning of the government”, including by inducing “hysterical mass behavior” (cited in Haines, 1999, p. 72). As such, it explicitly recommended the National Security Council debunk UFO reports and establish a policy of public education to reassure the public regarding the lack of evidence on the topic.

Similar patterns were observed in relation to Project Blue Book, which ran from 1952 to 1969. As with the Robison panel, although its reports included intriguing details that suggested some UAP were genuinely extraordinary, its overall effect was to gloss over these anomalies. A 1955 report, for example, “prepared by a panel of scientists both in and out of the Air Force,” examined 2,199 cases. Of the 213 in the “excellent” category (i.e., most credible and of the highest quality), while the majority were judged as having prosaic explanations – including astronomical phenomena (52), an aircraft (41), a balloon (25), other (15), and insufficient information (9) – one

third (71) were classified “unknown.” However, despite this large percentage, the overall conclusion was that it was “highly improbable” that the UAP studied “represent observations of technological developments outside the range of present-day scientific knowledge.” Given such blandishments, critics suggest Blue Book essentially continued the spirit of Grudge in aiming to downplay the issue (Michels, 2023). Yet despite these public reassurances, UAP caused ongoing concern to authorities in private, as admitted by Rear Admiral Hillenkoetter – first Director of the CIA, from 1947 to 1950 – with *The New York Times* (1960) quoting him as saying “Behind the scenes, high-ranking Air Force officers are soberly concerned about the UFO’s. But through official secrecy and ridicule, many citizens are led to believe the unknown flying objects are nonsense.” Similarly, Griffen (1960) reported that he “recently declared” – presumably in the late 1950s – “about the flying saucers” that “the unknown objects are under intelligent control. It is imperative that we learn where the UFO’s... come from and what their purpose is.” Griffen further notes that, regarding “World War II and the years immediately following,” Hillenkoetter said, “I know that neither Russia nor this country had anything even approaching such high speeds and maneuvers.”

Eventually, Congressional pressure led to the Air Force establishing an authoritative panel in 1966, led by physicist Edward Condon of the University of Colorado. His committee delivered its 1485-page report to the Air Force in November 1968, which it released in January 1969 (Condon, 1969). As per previous endeavors, a substantial minority of sightings resisted prosaic explanations. Indeed, the report suggested some UAP were genuinely extraordinary (e.g., extraterrestrial). One of its 59 detailed case studies, for example, was the Lakenheath-Bentwaters incident, involving radar and visual contacts with UAP over airbases in eastern England on the night of 13-14 August 1956. Of this, it concludes, “the probability that at least one genuine UFO was involved appears to be fairly high.” Crucially though, despite such anomalies, when it came to its overall conclusion, the report continued in the vein of its predecessors and declared that UAP were most likely prosaic. Even more damningly and consequentially, it declared the topic was of no scientific interest, stating, “Our general conclusion is that nothing has come from the study of UFOs in the past 21 years that has added to scientific knowledge.” Of course, this is at odds with its analysis of cases like Lakenheath-Bentwaters, and critics accused it of obfuscating the ongoing uncertainty around the topic. Hynek (1972) was particularly scathing, dismissing its summary introduction in particular as “singularly slanted,” not least as it “avoided mentioning that there was embedded within the bowels of the report a

remaining mystery; that the committee had been unable to furnish adequate explanations for more than a quarter of the cases examined.”

Indeed, some speculate the report was *designed* to dismiss the topic. A memo written in 1966 by Robert Low, for example – coordinator of the committee and a former CIA officer – states “the trick would be” to give the impression of “a totally objective study,” which critics have interpreted as a planned cover-up (Coulthart, 2021). Similarly, a letter written to Condon in 1967 by Lieutenant Colonel Hippler clearly communicates the Air Force’s desire to be relieved of Blue Book (“you must consider the cost of the Air Force program on UFOs, and determine if the taxpayer should support this for the next decade”) (Swords, 1995). Moreover, he suggests the report do this by closing down discussion of an ETH (e.g., “No one knows of a visitation. It should therefore follow there has been no visitation to date”). Indeed, Michels (2023) suggests Condon may have secretly been “clued into high-level UFO secrets from the start” through his role in the Manhattan Project (e.g., he recruited many of its staff and wrote the Los Alamos Primer all had to read), so may have been minded to help retain institutional secrecy. The context for his claim is Jacque Vallée’s allegation that Manhattan was secretly the “first Bluebook,” taking “custody” of UAP-related discoveries, which would then “go into the Atomic Energy Commission, and then it would go into the Department of Energy” (cited in Michels, 2023). To that point, David Grusch suggests the emerging atomic legislation provided a perfect cover for concealing UAP programs: “The guys who were involved in Manhattan were overlaying the same ecosystem of secrecy... [as for] protecting our nuclear secrets.” He notes that the definition of “special nuclear material” in the Atomic Energy Act of 1954 (H.R.5961, 1954) includes any material that is “capable of releasing substantial quantities of atomic energy,” which he suggested was used as a blanket cover for all materials retrieved from downed UAP. Hence, there is the suggestion that Condon was specifically selected as an institutional “gatekeeper” who could be relied upon to keep UAP-related information secret.

Whether such allegations have any merit is beyond the scope here. What is crucial is the effect the report had on the topic. Soon after, key scientific institutions endorsed his conclusions. The National Academic of Sciences noted that while “there remain UFO sightings that are not easily explained... so many reasonable and possible directions in which an explanation may eventually be found, that there seems to be no reason to attribute them to an extraterrestrial source without evidence that is much more convincing (Clemence et al., 1969, p. 6). Similarly, an article in *Science* proclaimed, “Condon group

finds no evidence of visits from outer space” (Boffey, 1969), while an editorial in *Nature* (1969) was particularly scornful, saying it would “be inapt to compare it with earlier centuries’ attempts to calculate how many angels could balance on the point of a pin; it is more like taking a sledgehammer to crack a nut, except that the nuts will be quite immune to its impact.” The result, as Hynek put it, “was the coup de grace to the UFO era. Science had spoken. UFOs didn’t exist, and the thousands of people who had reported strange sightings ... could all be discounted as deluded, hoaxers, or mentally unbalanced” (cited in Coulthart, 2021, p. 66). Indeed, not only did they not exist, within a scientific context, even taking their possibility seriously at all became taboo (Wendt & Duvall, 2008), with “ufology” (i.e., the study of the topic) generally derided as a “pseudoscience” (Eghigian, 2017), and UAP themselves relegated to the off-limits category of the paranormal.

### Relegation to the Paranormal

Following Condon, the UAP topic was effectively placed off limits by the scientific establishment, being adjudged as not real. This is not to imply a serious and widespread interest *pre*-Condon that suddenly became divested of its enthusiasm. It is perhaps more accurate to say that, while some scientists did pay keen attention to the topic, overall, the community was relatively disinterested and ambivalent. The Condon report then solidified and justified this disinterest. Here, it is useful to invoke Kuhn’s (1962) notion of scientific paradigms. While there are various strands to his thesis, the most relevant here is that, at any given time, certain paradigms can become dominant and others marginalized. What it means to be dominant is itself a complex question and involves power dynamics *vis-à-vis* numerous aspects of science, including methods, analyses, theories, and interpretation. In all these respects, a broad *consensus* can emerge regarding a phenomenon, including, most relevantly here, whether it actually exists. Of course, science is not a monolith; indeed, this is the value of Kuhn’s theory; one can still find contrary opinions and dissenting voices. However, they are marginalized by the dominant paradigm, which sets the boundaries of scientific inquiry. In terms of power dynamics, the dominant paradigm tends to be that which is upheld by the scientific “establishment” (a broad gestalt of influential scientists, organizations, journals, publishers, etc). In the present case, we see this establishment at work not only in the Condon report itself but also in responses from institutions like The National Academy of Sciences and journals like *Science* and *Nature*. That said, even within the establishment are dissenting voices who,

given their status, can help challenge and shift paradigm boundaries, as explored below. Nevertheless, one can still speak of a dominant paradigm and a general consensus.

However, even if the dominant paradigm determines a phenomenon does not exist and/or is not a scientific concern, one may well still find people who believe it *does* exist and *should* be a concern. This is the case with UAP – not merely in that some seemingly anomalous phenomena are currently unidentified, but that these may have explanations that are genuinely extraordinary, like an ETH. In these cases, such phenomena (i.e., judged by science as “unreal”) tend to become designated as “paranormal” (literally, alongside or above whatever is “normal”). The best way to appreciate the function of this concept is to consider the nature and role of science. While this in itself is a complex issue, one approach is to consider which phenomena are usually *not* deemed within the scope of science. Over the years, various attempts have been made to draw boundaries in that respect. Perhaps most influential is the differentiation by C. P. Snow (1959), who argued Western society had become split into two cultures: *science* (generally concerned with the empirical study of phenomena that can be measured and quantified) and the *humanities* (devoted to aspects of life not amenable to this kind of positivist approach but nevertheless of importance to people). Somewhat similarly, Stephen Jay Gould (1997) sought to carve out distinct roles for science and religion as each representing different areas and methods of inquiry – the science concerned with facts, religion with values – such that these constituted “non-overlapping magisteria.”

While these distinctions have been much debated, they are prominent ways of carving the epistemological and scholarly territory. Moreover, they are useful for apprehending the notion of the paranormal. In particular, this does not merely denote phenomena that some people think are real but which science has pronounced outside its domain, whether in the realm of culture (per Snow) or religion (per Gould). Crucially, it refers to phenomena that some people not only think are real but, moreover, believe science *should* pay attention to. By contrast, although many people believe God exists, for example, per Gould’s framework, this pertains to religion rather than science. From the perspective of science, individual scientists may or may not regard God as real, but his existence is generally not viewed – either by believers or disbelievers – as a *paranormal* phenomenon. Rather, it is generally accepted – crucially, usually by both believers and disbelievers – as being beyond the remit of science. By contrast, the paranormal pertains to phenomena some people think *should* be in the scientific domain. From this basic perspective, science is concerned with phenomena

that can be observed, measured, and quantified. However, the key question then becomes ascertaining *which* phenomena meet these conditions.

Sometimes, the issue is that a phenomenon that may be “observable” in some respects but resists simple measurement and quantification; many elements of human psychology, for instance, fall into that category. With other phenomena, though, the key issue is ontological: Do they actually *exist*? Or, more accurately, the question is *who* believes they exist and what power they have to adjudicate and legitimize what constitutes reality. Here, we return to the role of science, which in modern secular societies has tended to have this key adjudicating and legitimating function. Whether it still does to the same degree is another issue, given how trust in scientific authorities has eroded in recent years (Eshel et al., 2022). Nevertheless, at least until recently, scientists have played this key role. Of course, since science is not a monolith, as noted above, nevertheless, one can certainly speak of a broad *consensus*. In that respect, “normal” is whatever a consensus has established is real, and “paranormal” is whatever falls outside that demarcation. Most relevantly, post-Condon UAP have been placed squarely in the paranormal camp, alongside all manner of phenomena similarly dismissed with ridicule. This denigration is encapsulated, for example, in an obituary in *The New York Times* for James Randi, whom the headline calls the “Magician Who Debunked Paranormal Claims.” In this, he is described as having turned his “formidable savvy to investigating claims of spoon bending, mind reading, fortunetelling, ghost whispering, water dowsing, faith healing, U.F.O. spotting and sundry varieties of bamboozlement” (Fox, 2020). Crucially, however, the boundary between normal and paranormal is somewhat fuzzy and contested. Even if the scientific community overall has designated a phenomenon off limits, some scientists will still advocate bringing it back within limits and may well continue to study it, as we see next.

### Interest Goes Underground

Despite UAP being placed outside the boundaries of serious inquiry, some scientists nevertheless maintained an interest in the topic, yet largely outside mainstream science, concealed underground, so to speak. These include scholars already engaged the topic pre-Condon (such as Hynek and Vallée), as well as new generations of scholars arriving from the 1970s onwards – like Claude Poher in France (Poher & Vallée, 1975), Massimo Teodorani (1994) in Italy, and Peter Sturrock (1999) in the US – whom one might suggest felt gradually less constrained by the epistemological straightjacket imposed by Con-

don as his prominence and authority receded over time. Overall, these scientists fall into two main classes: those whose interest is open and public and those reportedly working in secret. That said, there may be overlap between them, with some in the first class perhaps also doing clandestine research.

Of the first class, the most well-known is Jacques Vallée, who began as an astronomer at the Paris Observatory and co-developed the first computerized map of Mars for NASA in 1963. Throughout his career, he has continued to publish influential works on the topic, like his 2008 book, *Dimensions: A Casebook of Alien Contact*. He has since been joined by others, notably Garry Nolan, an immunologist at Stanford who has not only engaged in UAP research over the past decade (e.g., Nolan et al., 2022) but has advocated for scientific engagement on this topic and indeed wrote a paper with Vallée elucidating processes for doing so (Vallée et al., 2018). Also prominent is Harvard’s Avi Loeb, director of the Galileo Project, which is systematically searching for “extraterrestrial technological artifacts,” some of which may constitute UAP (Loeb & Kirkpatrick, 2023). Indeed, Loeb argues two artifacts may have already actually engaged with Earth, one of which his team has actually potentially retrieved: an unusual meteor that fell into the Pacific Ocean in 2014 which was recognized as having an interstellar origin at “the 99.999% confidence [level] in an official letter from the US Space Command under DoD to NASA” (cited in Loeb, 2023c). Their search appears successful, retrieving more than 700 “sphericals” from its landing path (Loeb et al., 2023a). Moreover, as to their origin, one hypothesis offered by Loeb (2023b) is “an extraterrestrial technological origin,” though establishing this will require finding the intact object itself (rather than the sphericles, which are molten droplets from its surface), which Loeb hopes to recover in future. Whatever the outcome, figures like Nolan and Loeb are significant in challenging the way this topic is perceived by the scientific community, given their establishment credentials.

Then, in addition to these visible figures, other scientists may have similarly engaged in studying UAP, but in secret. If so, by definition, little would be publicly known about their activities. Nevertheless, some information has crept into the public domain. For example, even though Blue Book ended in 1969, there have long been allegations that the US government and military have maintained an interest in UAP. Significantly, in the past few years, some initiatives have been confirmed, notably the Advanced Aerospace Weapons System Applications Program (AAWSAP) – sometimes also known as the Advanced Aerospace Threat Identification Program (AATIP), with the latter acronym also used for a separate small-

er initiative at the Pentagon— which formally ran from 2008-2010. Funded with \$22 million from the Defense Intelligence Agency (DIA), it involved a company formed by Robert Bigelow and run by James Lacatski (a DIA intelligence officer). It was based at a 500-acre property in Utah owned at that point by Bigelow called “Skinwalker Ranch” – a name derived from a Navajo legend concerning vengeful shamans – with a long history of apparent paranormal activity. Hence, the title of a book by Lacatski et al. (2021) detailing the program, *Skinwalkers at the Pentagon*, which has since been augmented by a more recent book, *Inside the U.S. Government Covert UFO Program* (Lacatski et al., 2023). Strikingly, in the latter, they seemingly corroborate Grusch’s allegations, stating, “the United States was in possession of a craft of unknown origin.” Curiously, both books were cleared for release by the Pentagon; asked about this on the *Weaponized* (2023) podcast, Jeremy Corbell queried, “You told us because you were allowed to tell us that our government has a UFO in its possession and has been able to access the inside of it, right?” and Lacatski responded: “Yes, I was allowed to tell you.”

Most relevantly here, the project involved numerous scientists, including Lacatski himself (whose early research was on directed energy weapons), as well as Jay Stratton and Travis Taylor, both of whom have served on a UAP Task Force established in 2020 (discussed below). Thus, even while the dominant paradigm dismissed the UAP topic behind the scenes, it still seems to have attracted serious scientific attention. That said, this attention has generally not been facilitated or funded by mainstream scientific institutions but rather mainly by select individuals, such as Bigelow, who has the rare combination of interest in the topic combined with financial resources to explore it, as well as figures in authority like Senator Harry Reid, who had the political acumen and power to likewise corral resources towards these initiatives. Nevertheless, AAWSAP and AATIP are still notable examples of scientific engagement with the topic. Finally, in addition to this, “underground” engagement is a long tradition of more open and legitimized scientific interest in topics that are UAP-adjacent.

### Legitimised UAP-Adjacent Topics

While UAP have been delegitimized as a serious scientific topic (at least publicly), a host of *adjacent* research areas have become generally regarded as legitimate. These include the interrelated ideas of (a) extra-terrestrial life per se existing elsewhere and (b) such life potentially being intelligent, as explored by fields from astronomy to astrobiology. Interestingly, before the 20<sup>th</sup>

Century, the scientific consensus leaned towards both being true before changing tack as understanding developed, only to revert again. In the 19<sup>th</sup> Century, the existence not merely of life elsewhere but intelligent forms held sway, exemplified by an 1831 textbook, *The Young Astronomer*, which explained, “To the people who live on Mars, this earth probably appears larger than Mars does to us” (cited in Library of Congress, 2023). This view was solidified by the apparent observations of “canals” (a network of long straight lines) first described by Italian astronomer Giovanni Schiaparelli in 1877, though significantly, he called these simply *canali* (“channels”), which was mistranslated as “canals,” with the latter implying technological craftsmanship (Laskow, 2016). The idea was embraced by scientists, most notably renowned astronomer Percival Lowell, who published three books on the topic: *Mars* (1895), *Mars and its Canals* (1906), and *Mars as the Abode of Life* (1908). However, by the early 20<sup>th</sup> century, the consensus had turned against the idea of constructed canals, instead regarding these as merely optical illusions. The issue was then settled in 1965 when photographs taken by NASA’s Mariner IV found no canals, not even something that could be misinterpreted as such.

By this point, the scientific community had now deemed both (a) and (b) highly improbable, not least because planetary systems were thought to be very rare. Indeed, only in 1995 was the first extrasolar planet – orbiting 51 Pegasi, about 50 light-years away – discovered by Mayor and Queloz (1995). However, unlike UAP, these questions avoided being dismissed as “paranormal” and remained serious topics of inquiry. Moreover, with new technologies, the consensus has now shifted so that both (a) and even (b) are regarded as not only possible but a near *certainty* by most experts. The number of confirmed exoplanets in our galaxy is now above 5,000; moreover, NASA estimates the actual number could be more than 100 billion (Waichulis, 2023). Moreover, these numbers are for our galaxy alone, with NASA (2023) estimating the observable universe contains at least 2 trillion galaxies. Thus, if figures for our galaxy are applied across the cosmos, there could be 200 sextillion (200 billion trillion) extrasolar planets in the observable universe. Of course, not all may be habitable, which has historically been regarded as requiring a carefully calibrated “Goldilocks’ zone,” where conditions are “just right” (e.g., neither too hot nor cold). Even accounting for these parameters, though, such planets may be relatively common; some analyses suggest that *every* star could possibly host a habitable planet (Ojha et al., 2022).

Of course, even if life may be widespread, the question of intelligent or civilized forms is another matter entirely. Calculating its likelihood is difficult, attested to

by years of debates around the Drake Equation – of the number of detectable/contactable civilizations in the Milky Way (Drake et al., 2015) – and estimates vary wildly, depending on assumptions (Sandberg et al., 2018). Nevertheless, even if one stipulates, say, that the odds of a habitable planet actually producing intelligent life are a trillion to one – so vanishingly small as to be essentially non-existent – we could still have, per Ojha’s et al.’s suggestion that every star possibly hosts a habitable planet, up to 200 billion potential instances. Indeed, even if only one star in every *billion* had a habitable planet, this would still mean, based on the assumptions above, around 200 cases of intelligent life. As such, the scientific consensus now acknowledges intelligent life elsewhere does exist. Consider Bill Nelson, head of NASA, who is especially well-placed to comment: “My personal opinion is that the universe is so big, and now, there are even theories that there might be other universes. If that’s the case, who am I to say that planet Earth is the only location of a life form that is civilized and organized like ours?” (Todd, 2021, para. 3). Indeed, Westby and Conselice (2020) estimated the number of “Communicating Extra-Terrestrial Intelligent” civilizations just within our own galaxy, and even under the strictest criteria suggest there may be dozens.

Moreover, scholarship on UAP-adjacent areas is now encroaching onto the UAP question itself, expanding to consider the likelihood of such life actually engaging with Earth, hence being potentially responsible for UAP. This is still considered extremely unlikely due to the perceived difficulty of interstellar travel. Consider that our nearest stars, Alpha Centauri A and B, are 4.35 light years away. Our current fastest existing means of travel – Gravity Assist, which harnesses the relative movement and gravity of planets to accelerate a craft – would take 76,000 years to reach these (Williams, 2016). However, exponentially faster methods of travel are beginning to receive experimental testing. For example, an aerospace company (Pulsar Fusion) has begun construction of a nuclear fusion rocket engine, due for completion in 2027, that is predicted to create exhaust speeds of over 500,000 MPH (Sampson, 2023). Moreover, even faster methods are being developed. For example, NASA suggests a “laser sail” – ultrathin mirrors driven by focused energy beams – measuring 965 km in diameter could accelerate to half the speed of light in less than a decade. Work on such ideas is already underway, including “Project Starshot,” which plans to send a small sensory package to Alpha Centauri at 1/5 the speed of light (Parkin, 2018). Furthermore, even if such technologies are currently beyond our capacity, they may not be beyond civilizations who are more advanced. Physicists have speculated, for example, that it may be possible to exploit “wormholes” to take a “short

cut” through space (Frolov et al., 2023). Moreover, even if an interstellar voyage did take thousands of years, while impossible for biological organisms as we understand them, it would most certainly be feasible if the craft were piloted instead by AI systems, which Loeb and Kirkpatrick (2023) suggest is indeed the most likely scenario if some UAP really were extraterrestrial.

As such, even with UAP-adjacent topics, scientists have begun to broach the UAP question itself with more seriousness. Indeed, this possibility was recently recognized by NASA (2023), who, in 2022, set up a study team to explore the topic, which its recent report called “one of our planet’s greatest mysteries” (p. 7), one that “presents a unique scientific opportunity that demands a rigorous, evidence-based approach” (p. 3). Although it suggested there is currently “no conclusive evidence suggesting an extraterrestrial origin for UAP” (p. 25), it also notes that numerous UAP cases cannot at present be attributed to a conventional explanation, so an ETH is still on the table. In that respect, it acknowledges various possibilities, with “an intellectual continuum between extrasolar technosignatures, solar system SETI and potential unknown alien technology operating in Earth’s atmosphere. If we recognize the plausibility of any of these, then we should recognize that all are at least plausible” (p. 33). Moreover, recent developments are facilitating and even hastening such acknowledgments, as the second main part of this paper explores.

## UAP: THE CONTEMPORARY RESPONSE

Recent years, especially since 2017, have seen a remarkable change in openness regarding UAP from the authorities. However, the scientific community has remained largely disengaged from the topic. Even there, though, there are signs that attitudes may be shifting, given the evidence emerging on the topic. This part explores these ideas over several sections: (1) developments on this topic since 2017, (2) political and military responses to allegations of a crash retrieval program, and (3) the response of the scientific community.

### The Post-2017 UAP Era

Although the topic has generally been publicly downplayed by the authorities, especially since the late 1960s, this began to change in 2017, when footage of three military encounters with UAP was published online. This brought the topic to wider attention, especially following a *New York Times* article about AAWSAP, “Glowing Auras and ‘Black Money’: The Pentagon’s Mysterious U.F.O. Program” (Cooper et al., 2017). The military angle was especially significant. Prior to that point, there had

been numerous public sightings of UAP, with the Mutual UFO Network reportedly receiving over 200,000 since its founding in 1969 (Mellon, 2022). However, these have generally not been taken seriously by authorities and have tended to be dismissed, often just attributed to perceptual or cognitive error. However, reports emanating from the military are more credible for many reasons: they involve observers who have excelled in occupations that require the highest skill and training in visual perception and processing (e.g., fighter pilots), meaning they are regarded as higher-quality witnesses than the average observer; moreover, their testimony is often triangulated with other information sources (e.g., radar). Curiously, though, there is also a long history of UAP reports from non-military (e.g., commercial) pilots (Kean, 2010), yet even though they share many qualities of their military counterparts, their experiences did not have the same impact or significance for the authorities. Perhaps the difference is that military encounters have additional layers of interest and concern for authorities, such as vis-à-vis national security, which compelled their attention.

Whatever the dynamics, authorities began to take a more public and open stance. In April 2020, the Department of Defense (2020) confirmed the footage was genuine, prompting a *New York Times* article, “No Longer in Shadows, Pentagon’s U.F.O. Unit Will Make Some Findings Public” (Blumenthal & Kean, 2020). The next month, the US announced it was establishing a UAP Task Force charged with investigating these incidents, the latest iteration of which is known as the All-domain Anomaly Resolution Office (AARO). It has since produced three annual reports (Office of the Director of National Intelligence, 2021, 2023a, 2023b), albeit with limited scope (mainly events since 2019 and focusing on US airspace and littoral waters), as well as a historical review (AARO, 2024). In its initial 2021 report, of 144 events studied, in 143 cases, it determined we “lack sufficient information in our dataset to attribute incidents to specific explanations.” Its 2022 report (released in January 2023) examined a further 366 events, of which 177 similarly eluded identification and “demonstrated unusual flight characteristics or performance capabilities, and require further analysis.” Its most recent report in October 2023 – focusing on events up until April 2023 – added a further 291 cases, bringing the total to 801, noting “many reports from military witnesses do present safety of flight concerns, and there are some cases where reported UAP have potentially exhibited one or more concerning performance characteristics such as high-speed travel or unusual maneuverability.” Furthermore, the report suggests these cannot be attributed to the US (“AARO has de-conflicted these cases with potential US programs”) or its adversaries (“none of these UAP

reports have been positively attributed to foreign activities”). Speaking about the cases under review in May 2023, Dr Kirkpatrick, Director of AARO at the time, said he suspected most *did* have conventional explanations and only remained unidentified due to a lack of good data. However, around two to five percent – roughly 15-40 – were “possibly really anomalous” (Wendling, 2023).

Moreover, critics believe AARO may be deliberately downplaying the significance of the topic and the extraordinary nature of some evidence, following a trend with comparable previous investigations as discussed above. Boswell (2022) reported that a source in the Office of the Director of National Intelligence had told him, “They’re patting themselves on the back that they’ve resolved over half of them... But we don’t give a crap about the ones they’ve resolved. Yeah, there’s balloons up there, and balloons are sometimes mistaken for UAP. But there are s\*\*\*loads of classified videos that are pretty profound and pretty clear. They don’t want to talk about this stuff, because they really, really don’t know what the hell they are” (para. 14-17). Indeed, in the eyes of many critics, AARO has become discredited as a genuine attempt to engage with the issue, instead seeming to serve - as per its predecessors - as a way of downplaying and denigrating the topic. In March 2024, for example, AARO (2024) released a Historical Record Report, purporting to cover more than 70 years of US records relating to UAP, which stated that it had “found no evidence that any USG investigation, academic-sponsored research, or official review panel has confirmed that any sighting of a UAP represented extraterrestrial technology.” In response though, many observers were scathing at what they regarded as a yet another official attempt to obfuscate the subject; indeed, Lue Elizondo (2024), former director of the AATIP program at the Pentagon, publicly accused the report of being “intentionally dishonest, inaccurate, and dangerously misleading.”

To that point, despite the blandishments offered by AARO, comments from key figures indicate the possibility of some UAP being truly extraordinary is being taken seriously. John Ratcliffe, for example, former Director of National Intelligence, said, “We are talking about objects that have been seen by Navy or Air Force pilots, or have been picked up by satellite imagery, that frankly engage in actions that are difficult to explain, movements that are hard to replicate, that we don’t have the technology for” (Lewis-Kraus, 2021, para. 11). Moreover, despite the efforts to investigate such phenomena, some are still perplexing authorities. Speaking in August 2023, for instance, General Mark Milley, Chairman of the Joint Chiefs of Staff, said the military “can explain a lot of it [i.e., UAP], but there is some that’s really kind of weird and unexplainable” (Wolfgang, 2023). It has even been reported

by Coulthart (2023) that, on 1st February 2023, 8-9 UAP were detected over the Arctic Circle, and fighter jets were sent to intercept, but the UAP “maneuver[ed] away, apparently at high speed.” Strikingly, the US government publicly admitted shooting down another UAP over Alaska on 10<sup>th</sup> February. Furthermore, Coulthart suggests it was genuinely “anomalous” (unlike a Chinese spy balloon shot down the previous week) and argues it is significant that over a year later, still no information or imagery has been released about it (also unlike the spy balloon). Such admissions already bring us into unusual ontological territory. However, in the summer of 2023 came some even more striking developments.

### Grusch Allegations

In June 2023, dramatic claims regarding a UAP crash retrieval program were made publicly by David Grusch, as noted at the start. Our interest here is not the allegations per se (since these cannot yet be verified) but more the *reaction* to these, especially from scientists. In that respect, it is worth briefly reflecting on the *nature* of his claim, as this will help us contextualize and better understand the validity (or otherwise) of such reactions. A key claim made by skeptics is that neither Grusch nor those corroborating him have personally seen any such potential craft and are merely passing along unsubstantiated rumors. Grusch was challenged about this on BBC Radio 4 (2023) in August, accompanied by his attorney Charles McCullough III (notably, the intelligence community’s first Inspector General). He was asked, “But how do you know they [the government] have these items [i.e., craft], because you’ve not seen them yourself?” to which he said: “There are certain things I have first-hand access to that I can’t publicly discuss at this time. However, myself and other colleagues interviewed, you know, 40 individuals, both current and former highly distinguished intelligence and military personnel that were specifically on these programs, and those that were willing I directed to the Intelligence Community Inspector General, and so the Inspector General was able to interview people that do have direct, first-hand information.” The interviewer followed up, “Right, so they have that *information* directly. Have *they* actually seen these vehicles?” To this, Grusch replied, “The individuals that I directed to the Inspector General, yes, they have the first-hand experiences, yes.”

Summarizing the situation, Von Rennenkampff (2023b) suggested there are two main possibilities, both incredible: “Either the U.S. government has mounted an extraordinary, decades-long coverup of UFO retrieval and reverse-engineering activities, or elements of the defense and intelligence establishment are engaging in

a staggeringly brazen psychological disinformation campaign” (para. 2). A potential third option that “dozens of high-level, highly-cleared officials have come to believe enduring UFO myths, rumors and speculation as fact” appears “increasingly unlikely”: given “significant penalties for making false statements to an inspector general, it is extremely unlikely that multiple high-level, highly-cleared officials would falsely claim to have first-hand knowledge of myths and rumors.” Hence, the two main options presented by Von Rennenkampff, both of which are highly consequential. To that point, his allegations seem to have been taken seriously by lawmakers, most notably the proposed UAP Disclosure Act (U.S.C. S.2226, 2023), as introduced above. Explaining his motives, Schumer wrote, “The American public has a right to learn about technologies of unknown origins, non-human intelligence, and unexplainable phenomena” (Bolton, 2023, para. 3).

The Act is replete with striking language; even the title seems consequential, given that “disclosure” is the term UAP observers use for the process by which authorities, long suspected to have withheld evidence of non-human intelligence, release this information. Revealingly, the Act even alludes to Grusch’s allegation of a crash retrieval program – including authorities not only possessing UAP craft but actual non-human “pilots” – in referring to “legacy programs,” defined as “all Federal, State, and local government, commercial industry, academic, and private sector endeavors to collect, exploit, or reverse engineer technologies of unknown origin or examine biological evidence of living or deceased non-human intelligence” (p.6).

The impact of Grusch’s allegations was further illustrated by a Congressional hearing of the House Oversight Committee on July 26 (C-Span, 2023). There were three main witnesses testifying under oath: Grusch himself, plus two former Navy pilots, David Fravor and Ryan Graves, who have been vocal about UAP encounters they and their colleagues have experienced. The pilots’ testimony was striking, including discussions of how common military UAP encounters are. As Graves put it, “These sightings are not rare or isolated. They are routine. Military air crew and commercial pilots, trained observers whose lives depend on accurate identification, are frequently witnessing these phenomenon.” However, he also estimated only around 5% of these were formally reported by personnel to their superiors, mainly due to the “stigma” attached to the topic and related “fear” of various kinds (e.g., perceived as having mental health issues, thereby jeopardizing one’s career). However, even this newsworthy testimony paled in comparison to Grusch’s. Although unable to provide classified details in this public forum, he emphasized that he had provided these to the



Inspector General. Furthermore, he did offer some information about some claims. Asked, for example, “Do we have the bodies of the pilots who piloted this craft?” he replied, “Biologics came with some of these recoveries.” Questioned whether these were “human or non-human,” he said, “Non-human,” clarifying, “That was the assessment of people with direct knowledge on the program I talked to that are currently still on the program.” Such was the explosive nature of the hearing. However, the most pertinent question here is, how has the scientific community reacted to these events?

### Scientific Reaction

Before exploring these reactions, it is worth reiterating the significance of these developments. After all, people make extraordinary claims all the time, and scientists are under no obligation to be open to all wild allegations that tend to be viewed as paranormal (or similarly dismissed with pejoratives like “conspiracy theory”). Here, the crucial point is not the allegations aired above, per se, but the context in which these have been made and the institutional processes that have unfolded in response, including the Disclosure Act and the Congressional hearing. Surely, even the most skeptical observer must admit these responses are unusual and mean the testimony of Grusch et al. cannot simply be summarily dismissed (e.g., as tall tales of uninformed cranks). Strikingly, though, this kind of dismissal has been all too evident in the scientific community. Gauging the reaction of the establishment per se is difficult since the events are too recent to have already generated the kind of institutional reactions seen in response to the Condon Report. However, hints are evident on social media platforms, which offer a faster indication of the sentiment of a given community.

Of course, since the scientific community is not a monolith, various responses were evident. Nevertheless, it was striking the extent to which well-known scientific figures – which to an extent can be regarded or at least perceived as the “voice” of the establishment – were not merely skeptical of the hearing but were outright dismissive as if the very possibility of even paying attention was ridiculous. This attitude was exemplified by two figures who are not only among the world’s most famous scientists but specialize in the very fields involved in this topic, Brian Cox and Neil deGrasse Tyson. Following the hearing, Cox (2023) expressed – to his 3 million “X” (formally Twitter) followers – a general disinterest in proceedings with a post that began, “I keep being asked what I make of the UFO thing in Congress yesterday, so here it is: I watched a few clips and saw some people who seemed to believe stuff saying extraordinary things without presenting ex-

traordinary evidence.” Tyson’s reaction was even more dismissive; in the week following, he only posted twice, both to mock the hearing. One concerned the poor quality of some publicly available evidence: “Sometimes I wonder whether alien space vessels are inherently fuzzy & out-of-focus (that would be terrifying)” (Tyson, 2023a). The other was to claim Grusch’s allegation about “biologics” were likely entirely prosaic: “To be clear, all animal, plant, and microbial life on Earth, minus humans, constitutes “non-human biologics.” (Tyson, 2023b). It would seem his skepticism lies partly in his belief – as reported by Sforza (2023) – that authorities would not be capable of concealing such secrets (“Do you think the government is that competent, that they can actually keep such a secret? Oh, my gosh, when did you get that much confidence in the U.S. government?”), and also that the public would be aware of any NHI incursion (“If we had an alien invasion... We would know about it... because everybody has a... high-resolution camera [i.e., on their smartphone]”). That said, he did acknowledge that “We have things we don’t understand in the sky,” so he conceded, “I think the government should investigate them ... because I don’t want to be susceptible to a risk that we don’t otherwise know about.” However, his tone overall was fundamentally dismissive.

Moreover, such attitudes seemed widespread, including those with expertise in the very topics connected to UAP. Most striking perhaps was Seth Shostak, senior astronomer at the SETI Institute, which, of course, is specifically interested in extraterrestrial intelligence, who, beyond just tweeting, took the effort to write an article for MSNBC mocking the hearing (Shostak, 2023). Wondering “Where is the evidence?” – of course, a reasonable question – he simply said, “It’s MIA. Neither Grusch nor anyone else claiming to have knowledge of secret government UAP programs has ever been able to publicly produce convincing photos showing alien hardware splayed across the landscape... The believers maintain that such photos exist but are being kept under wraps. For reasons that are always unclear, the critical evidence that would convince anyone of alien presence in our ‘hood is classified. It can’t be made public.” This reasoning overlooks the context of Grusch’s allegations, including that this evidence is classified and that Grusch *has* reportedly given it to the Inspector General and said he could provide it to politicians behind closed doors. Shostak maintained this tone in interviews on the hearing, joking with the LA Times about the possibility of interstellar travel (Petri, 2023): ““It’s very expensive to do that ... And aliens probably don’t have “unlimited amounts of alien money,” he added with a chuckle.””

It is one thing for the public to have this kind of dis-

missive reaction. Indeed, several articles highlighted the extent to which many people seemed uninterested in the hearing, such as a piece in *Forbes* titled “Nobody cares about David’s Grusch’s revelations” (Di Placido, 2023). However, from figures like Cox and Tyson (who study the cosmos), and especially Shostak (who has specifically focused on extraterrestrial intelligence), such dismissals are striking. Indeed, Grusch (2023) himself made this point, saying of Tyson, “He’s made up his mind. I’ve read his tweets, and I’m like, ‘Dude, you have a PhD in physics, where’s your curiosity!’” To be clear, skepticism regarding the hearing and the topic generally is not only reasonable but essential from a scientific perspective. However, these responses go beyond skepticism into dismissal and disinterest, which is arguably *anti*-scientific. This point was made by Von Rennenkampff (2023b) in an article entitled “NASA’s Approach to UFOs Appears Remarkably Unscientific.” He cited the NASA hearing mentioned above, particularly Dr Kirkpatrick’s remarks about the “orbs” being seen “all over the world... making very interesting apparent maneuvers.” As Von Rennenkampff writes, “Kirkpatrick’s comments should have immediately piqued the scientific curiosity of every individual in the room. How, after all, can spherical objects, lacking wings or apparent means of propulsion, remain stationary or travel at the speed of sound?” However, “not one of the NASA panel’s 16 members asked Kirkpatrick anything about his extraordinary comments. It raises the question: Are UFOs the death knell of scientific curiosity and inquisitiveness?”

This latter sentence is significant. Perhaps the most charitable explanation for the reaction to the hearing by figures like Cox and Tyson and of NASA panelists to Kirkpatrick is that as far as the dominant paradigm is concerned, UAP are still firmly in the paranormal box in which they were placed following Condon, alongside other phenomena long dismissed as non-existent, from ghosts to fairies. In that respect, the topic *needs* no engagement, just as scientists are not generally engaged in investigating the existence of fairies. To that point, we can see how dominant paradigms are tenacious and resistant to change while competing paradigms that are currently marginalized – such as one deeming UAP a genuine topic of inquiry – struggle to gain a foothold. However, the key question is whether UAP *still* deserves to be dismissed as paranormal or, conversely, whether these new developments mean they should be taken seriously. Indeed, numerous eminent figures have argued just that. Garry Nolan (2023a), for instance, took issue with people arguing the UAP hearing did not produce any evidence, writing, “People say they want evidence. Short of walking out of an NHI or flying a UAP over Congress in real time, please

define what you want to see? I mean it... state what you want? And how you would get it and believe it? I’ll give you my approach: So, what Congress is doing is the beginning of a scientific and forensic process. They are collecting verified data (see the UAP amendment) and getting sworn oaths, which will lead to and allow them to invoke investigatory powers. This is both a legal and a political process, but it uses tools of science.”

In this way, one can see how the scientific community could and *should* engage with the topic in a skeptical, open-minded way. Indeed, as emphasized by Nolan, we *need* engagement from scientists, especially given how elusive and confounding many UAP data points appear to be. It can even be helpful to hear from skeptics of extraordinary explanations for UAP, provided they engage in a spirit of genuine inquiry rather than simply seeking to “debunk” according to an *a priori* dismissal of the ETH. Mick West, for instance, has skillfully demonstrated that some UAP cases most likely are prosaic (Boswell, 2023), yet also seems to avoid evidence that conflicts with his own interpretations (Phelan, 2023), so his contribution overall is ambiguous, and on balance risks turning people away from taking the subject seriously.

This claim was put directly to West by Eric Weinstein on Curt Jaimungal’s (2022) podcast, in an episode titled “UAPs, evidence, skepticism,” and he somewhat conceded the point. However, among the scientific community overall, arguably, sentiments are now shifting, perhaps in relation to developments like the Task Force. One indication is a survey by Yingling et al. (2023) of 1460 faculty at elite US institutions between February and April 2022. The vast majority were not particularly aware of the topic: asked, “In the past several years how often have you heard news about the UAP topic?,” 85% said either never (6.3%), rarely (30.27%) or just occasionally (48.7%), while *vis-à-vis* seeking out such news, 94% said either never (42.9%), rarely (31.8%), or occasionally (19.32%). However, in terms of *curiosity* about the topic, only 17.2% were “not curious,” while the vast majority either “slightly” (25.41%), “moderately” (25.34%), “very” (16.78%), or “extremely” (15.27%) curious. Commenting on this, Nolan (2023a) said, “Legitimacy around the subject matter-- and bringing a professional and scientific/sociological and ... dare I say... religious perspective is increasing. Academics are starting to do what matters-- paying attention and not dismissing the subject matter outright. The increasing number of emails and communications from colleagues now beginning to open their eyes to this, and rejecting knee-jerk pseudo-skepticism is astonishing to me.”

There may still be work to do, as exemplified in an article in *Scientific American* by Kloor (2023), “How Wealthy UFO Fans Helped Fuel Fringe Beliefs: There is a Long U.S.

Legacy of Plutocrat-Funded Pseudoscience. Congress Just Embraced It.” Indeed, even scientists close to the topic seem to retain a wary skepticism; Avi Loeb, for instance, was asked about Grusch and dismissively said, “So, this David Grusch guy is basing his entire claim on conversations that he had,” not “actual evidence” (Hawgood, 2023, para. 45). Likewise, when asked about a documentary on Grusch, he said, “We need to look through telescopes and be collecting data through instruments, not through people talking about it on social media... Somebody interviewing another guy who tells the story — who cares?” (para. 46). As noted above vis-à-vis similar dismissals from Shostak, Grusch *has* provided evidence to relevant authorities but cannot share this publicly. Thus, for someone of Loeb’s intelligence and interest to trivialize his allegations suggests he has not followed the story closely (as he himself admits in the article), perhaps because it seems too sensationalistic to be credible, which indeed is a reasonable assumption. However, given the developments of recent years, perhaps all scientists are on journeys of re-evaluating assumptions, moving at varying speeds with respect to different aspects of the phenomenon but crucially with their overall stance shifting towards greater openness and interest. Indeed, Loeb himself subsequently said he was starting to take Grusch’s allegations more seriously. In an interview with Chris Cuomo (2023) in December, he revealed he had just spoken with Grusch for over an hour about “how scientists could get engaged” with the claims and issues raised by Grusch. Indeed, Loeb said that he himself “would love to know more about what the government has, and you know I’m willing to go through any hoops that are required to [get] access to those materials.”

Similarly, even in hitherto skeptical institutions, the tide may be shifting; in contrast to the tone of Kloor’s article, *Scientific American* also more recently published a piece titled, “It’s Time to Hear From Social Scientists About UFOs” (Eghigan & Peters, 2023), which argues that, “We don’t conclusively know if UAP physically exist beyond the mundane, but we do know this: UFOs are social facts... Social scientists should weigh in on UAP, now.” (para. 5-6). Such sentiments align with the arguments in this paper and perhaps indicate that the developments being encouraged here are already starting.

## DISCUSSION

UAP have long been dismissed as a topic of serious scientific interest, especially following the Condon Report, which asserted these likely had a prosaic explanation and did not merit further scrutiny. Subsequently, the topic was relegated to the paranormal, a category for phenomena that some people believe exist and should be

studied but which the scientific establishment has adjudicated is not real and hence not of empirical interest. Some scientists have still taken an interest in the topic, whether in a fringe or secret way or exploring adjacent areas (such as the possibility of extraterrestrial life). However, it retains the stigma of the paranormal and remains outside the boundaries of serious inquiry. However, recent years have seen various developments that warrant re-thinking this position, including the establishment of the UAP Task Force and, more recently, the allegations of David Grusch, followed by the proposed UAP Disclosure Act and the Congressional hearing in July. Of course, none of these developments mean that UAP are *necessarily* extraordinary. Surely, though, they carry enough weight and significance to encourage scientists to at least engage seriously and revisit the assumptions that may cause them to dismiss the topic.

Indeed, the history of science is replete with instances in which establishment figures and institutions confidently dismissed phenomena that seemed improbable from within the dominant paradigm but which subsequently proved to be genuine. For example, right up until the Wright Brothers made their first successful flight in 1903, many scientists were adamant such a feat was against the “laws of physics.” Most famously, Lord Kelvin – mathematical physicist, engineer, and President of the Royal Society of England – declared in 1895, “I can state flatly that heavier-than-air flying machines are impossible” (cited in Winston, 2002, p. 292). As such, we should not only be wary of assuming the current state of scientific knowledge is complete but should expect it is *not*, so with humility and curiosity, keep an open mind to possibilities, even if they seem highly unlikely at present. Indeed, new scientific and technological advances are constantly bringing forth new discoveries about the cosmos, such as the detection of the gravitational wave “background” of the universe (Eureka Alert, 2023). This point about openness was emphasized by Loeb (2023b) in relation to his mission to recover the interstellar spherules. He admitted he could easily have “decided not to pursue this project because of the extreme pushback from “experts” on space rocks who were “sick about hearing Avi Loeb’s wild claims,” according to a *New York Times* article and a *New York Times Magazine* profile. However, the success of the expedition illustrates “the value of taking risks in science despite all odds as an opportunity for discovering new knowledge,” with the spherules providing “a wake-up call from afar, urging astronomers to be more curious and open-minded.” Thus, given recent developments regarding UAP, the topic now surely warrants at least serious engagement from the scientific community.

## REFERENCES

- All-domain Anomaly Resolution Office. (2024, March 8). Report on the Historical Record of U.S. Government Involvement with Unidentified Anomalous Phenomena (UAP). Volume I. February 2024. Department of Defense. <https://media.defense.gov/2024/Mar/08/2003409233/-1/-1/0/DOPSR-CLEARED-508-COMPLIANT-HRRV1-08-MAR-2024-FINAL.PDF>
- Barnes, J. (2023, July 13). Bipartisan measure aims to force release of U.F.O. records. *The New York Times*. <https://www.nytimes.com/2023/07/13/us/politics/ufo-records-schumer.html>
- Blumenthal, R., & Kean, L. (2020, July 23). No longer in shadows, Pentagon's U.F.O. unit will make some findings public. *New York Times*. <https://www.nytimes.com/2020/07/23/us/politics/pentagon-ufo-harry-reid-navy.html>
- Boffey, P. M. (1969). UFO study: Condon group finds no evidence of visits from outer space. *Science*, 163(3864), 260–262. <https://doi.org/10.1126/science.163.3864.260>
- Bolton, A. (2023, July 14). Senators to offer amendment to require government to make UFO records public. *The Hill*. <https://thehill.com/homenews/senate/4097653-senators-to-offer-amendment-to-require-government-to-make-ufo-records-public/>
- Boswell, J. (2022, October 31). New classified report to Congress says only half of UFO sightings can be properly explained, leaving nearly 200 mysteries unsolved – as critics say investigators “glossed over” unknown cases. *The Daily Mail*. <https://www.dailymail.co.uk/news/article-11373603/New-classified-report-congress-says-HALF-UFO-sightings-properly-explained.html>
- Boswell, J. (2023, July 11). Sighting of hovering black triangular “UFO” is debunked as simply flares slowly descending over California military base in 2021. *The Daily Mail*. <https://www.dailymail.co.uk/news/article-12284205/UFO-sighting-DEBUNKED-simply-flares-slowly-descending-California-military-base-2021.html>
- Chen, S. (2021, June 4). China military uses AI to track rapidly increasing UFOs. *South China Morning Post*. <https://www.scmp.com/news/china/science/article/3136078/china-military-uses-ai-track-rapidly-increasing-ufos>
- Clemence, G. M., Crane, H. R., Dennison, D. M., Fenn, W. O., Hartline, H. K., Hilgard, E. R., & Villard, O. G. (1969). Review of the University of Colorado Report on Unidentified Flying Objects by a panel of the National Academy of Sciences. Defense Technical Information Center.
- Condon, E. U. (1969). *Scientific study of unidentified flying objects*. University of Colorado at Boulder.
- Cooper, H., Blumenthal, R., & Kean, L. (2017, December 16). Glowing auras and ‘Black Money’: The Pentagon’s mysterious U.F.O. program. *New York Times*. <https://www.nytimes.com/2017/12/16/us/politics/pentagon-program-ufo-harry-reid.html>
- Coulthart, R. (2021). *In plain sight: An investigation into UFOs and impossible science*. Harper Collins.
- Coulthart, R. (2023, November 2). Is the Pentagon hiding something on UAPs. *News Nation*. <https://www.newsnationnow.com/video/ufo-mystery-over-the-arctic-circle-is-the-pentagon-hiding-something-vargas-reports/9139466/>
- Cox, B. (2023). I keep being asked what I make of the UFO thing... *Twitter*. <https://twitter.com/ProfBrianCox/status/1684474186842927109>
- C-Span. (2023, July 26). Hearing on unidentified aerial phenomena. *C-Span*. <https://www.c-span.org/video/?529499-1/hearing-unidentified-aerial-phenomena>
- Cuomo, C. (2023, December 19). Harvard Professor Avi Loeb on Antisemitism and Alien Life. The Chris Cuomo Project. [https://www.youtube.com/watch?v=GhRiQEB6\\_GU](https://www.youtube.com/watch?v=GhRiQEB6_GU)
- Defense, D. of. (2020, April 27). Statement by the Department of Defense on the release of historical Navy videos. Department of Defense.
- Di Placido, D. (2023, July 27). Nobody cares about David’s Grusch’s revelations. *Forbes*. <https://www.forbes.com/sites/danidiplacido/2023/07/27/nobody-cares-about-david-gruschs-ufo-revelations/>
- Drake, F., Vakoch, D. A., & Dowd, M. F. (2015). *The Drake equation: Estimating the prevalence of extraterrestrial life through the ages*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139683593>
- Durant, F. C. (1953, February 16). Memorandum for the assistant director for scientific intelligence from F C Durant, ‘Report of meetings of the office of scientific intelligence scientific advisory panel on unidentified flying objects, January 14–18, 1953, 16th February 1953. Office of Scientific Intelligence Scientific Advisory Panel on Unidentified Flying Objects.
- Eberhart, C. (2023, July 29). Russian UFO engagements, secret “Tic Tac” report and 3 key figures slip under radar at Congressional hearing. *Fox News*. [https://www.foxnews.com/us/russian-ufo-engagements-secret-tic-tac-report-key-figures-slip-under-radar-congressional-hearing?intcmp=tw\\_fnc](https://www.foxnews.com/us/russian-ufo-engagements-secret-tic-tac-report-key-figures-slip-under-radar-congressional-hearing?intcmp=tw_fnc)
- Eghigian, G. (2017). Making UFOs make sense: Ufology, science, and the history of their mutual mistrust. *Pub-*

- lic Understanding of Science*, 26(5), 612–626. <https://doi.org/10.1177/0963662515617706>
- Eghigan, G., & Peters, C (2023, October 2). It's time to hear from social scientists about UFOs. *Scientific American*. <https://www.scientificamerican.com/article/its-time-to-hear-from-social-scientists-about-ufos/>
- Elizondo, L. (2024, March 8). Apologies.... X. <https://twitter.com/LueElizondo/status/1766231733236584545>
- Eshel, Y., Kimhi, S., Marciano, H., & Adini, B. (2022). Conspiracy claims and secret intentions as predictors of psychological coping and vaccine uptake during the COVID-19 pandemic. *Journal of Psychiatric Research*, 151, 311–318. <https://doi.org/10.1016/j.jpsychires.2022.04.042>
- Eureka Alert. (2023, June 28). Gravitational waves from colossal black holes found using “cosmic clocks.” *Eureka Alert*. <https://www.eurekaalert.org/news-releases/993741>
- Fox, M. (2020, October 21). James Randi, magician who debunked paranormal claims, dies at 92. *The New York Times*. <https://www.nytimes.com/2020/10/21/obituaries/james-randi-dead.html>
- Frolov, V. P., Krtous, P., & Zelnikov, A. (2023). Ring wormholes and time machines. *Physical Review*, 108(024034), 1–25. <https://journals.aps.org/prd/pdf/10.1103/PhysRevD.108.024034>
- Gould, S. J. (1997). Nonoverlapping magisteria. *Natural History*, 106, 16–22.
- Griffen, B. (1960, June 1). Ex-C.I.A chief wants U.F.O. probe. *Worcester Gazette*. <https://www.cia.gov/reading-room/docs/CIA-RDP68-00046R000200090025-2.pdf>
- Grusch, D. (2023, September 10). UFO whistleblower Dave Grusch tells me everything. *American Alchemy*. <https://www.youtube.com/watch?v=kRO5jOa06Qw>
- Haines, G. K. (1999). CIA's role in the study of UFOs, 1947–90: A die-hard issue. *Intelligence and National Security*, 14(2), 26–48. <https://doi.org/10.1080/02684529908432538>
- Hanks, M. (2023, September 29). US department of energy UAP documents reveal puzzling aerial incursions near American nuclear sites. *The Debrief*. <https://thedebrief.org/u-s-department-of-energy-uap-documents-reveal-puzzling-aerial-incursions-near-american-nuclear-sites/>
- Hawgood, A. (2023, October 5). Behind the scenes of a UFO whistleblower's odd visit to Capitol Hill. *The Washington Post*. <https://www.nytimes.com/1960/02/28/archives/air-forge-order-on-saucers-cited-pamphlet-by-the-inspector-general.html>
- H.R.5961, 117th Congress. (1954, August 30). The Atomic Energy Act of 1954. U.S.C. §§ 2011–2021, 2022–2286i, 2296a–2297h-13,. U.S. Government Publishing Office.
- Huyghe, P. (1979, October 14). U.F.O files: The untold story. *The New York Times*. <https://www.nytimes.com/1979/10/14/archives/ufo-files-the-untold-story.html>
- Hynek, J. A. (1972). *The UFO experience: A scientific inquiry*. Henry Regnery Company.
- Hynek, J. A. (1977). *The Hynek UFO report*. Dell.
- Jaimungal, C. (2022, July 7). Eric Weinstein & Mick West: UAPs, evidence, skepticism. *Theories of Everything with Curt Jaimungal*. <https://www.youtube.com/watch?v=dwcjpmVomqc>
- Johnson, D. D. (2023, December 13). Quick guide to UAP-related provisions in the final FY2024 National Defense Authorization Act. *Mirador*. <https://douglasjohnson.ghost.io/quick-guide-to-uap-related-provisions-in-the-final-fy-2024-national-defense-authorization-act/>
- Kean, L. (2010). *UFOs: Generals, pilots, and government officials go on the record*. Three Rivers Press.
- Kloor, K. (2023, August 25). How wealthy UFO fans helped fuel fringe beliefs: There is a long U.S. legacy of plutocrat-funded pseudoscience. Congress just embraced it. *Scientific American*. <https://www.scientificamerican.com/article/how-wealthy-ufo-fans-helped-fuel-fringe-beliefs/>
- Kuhn, T. S. (1962). *The structure of scientific revolutions*. University of Chicago Press.
- Lacatski, J., Kelleher, C. A., & Knapp, G. (2021). *Skinwalkers at the Pentagon: An insiders' account of the secret government UFO program*. Independently published.
- Lacatski, J., Kelleher, C., & Knapp, G. (2023). *Inside the U.S. government covert UFO program: Initial revelations*. Bowker. <https://podcasts.apple.com/us/podcast/inside-the-dias-secretive-ufo-investigation-guests-dr/id1664299388?i=1000631572518>
- Laskow, S. (2016, January 5). A short history of Martians. *Slate*. <https://slate.com/human-interest/2016/01/how-humans-have-imagined-martians-and-mars-in-literature-and-other-media-since-the-late-19th-century.html>
- Lewis-Kraus, G. (2021, April 30). How the Pentagon started taking U.F.O.s seriously. *The New Yorker*. <https://www.newyorker.com/magazine/2021/05/10/how-the-pentagon-started-taking-ufos-seriously>
- Library of Congress. (2023). Seeing and interpreting Martian oceans and canals. *Library of Congress*. <https://www.loc.gov/collections/finding-our-place-in-the-cosmos-with-carl-sagan/articles-and-essays/life-on-other-worlds/seeing-and-interpreting-martian-oceans-and-canals>
- Loeb, A. (2023a, July 3). Summary of the successful inter-

- stellar expedition. *Medium*. <https://avi-loeb.medium.com/summary-of-the-successful-interstellar-expedition-61ff4467070d>
- Loeb, A. (2023b, August 29). The IM1 spherules from the Pacific Ocean have extrasolar composition. *Medium*. <https://avi-loeb.medium.com/the-im1-spherules-from-the-pacific-ocean-have-extrasolar-composition-f025cb03dec6>
- Loeb, A. A., & Kirkpatrick, S. M. (2023). Physical constraints on unidentified aerial phenomena. Under Review. [https://www.mentealternativa.com/ma\\_media/2023/03/LK1.pdf](https://www.mentealternativa.com/ma_media/2023/03/LK1.pdf)
- Loeb, A., Adamson, T., Bergstrom, S., Cloete, R., Cohen, S. et al., (2023). Discovery of spherules of likely extrasolar composition in the Pacific Ocean site of the CNEOS 2014-01-08 (IM1) bolide. Under Review.
- Lomas, T. (2023). A global picture of unidentified anomalous phenomena: Towards a cross-cultural understanding of a potentially universal issue. *International Social Science Journal*. Advance online publication <https://doi.org/10.1111/issj.12484>
- Lomas, T. (2024). The extraterrestrial hypothesis: A case for scientific openness to an interstellar explanation for Unidentified Anomalous Phenomena. *Philosophy and Cosmology*, 32, 34-59. <https://doi.org/10.29202/phil-cosm/32/3>
- Lomas, T., & Case, B. (2023). From angels to aliens: Humankind's ongoing encounters with, and evolving interpretations of, the genuine celestial unknown. *Zygon*<sup>®</sup>, 58(3), 614-635. <https://doi.org/10.1111/zygo.12891>
- Lowell, P. (1895). *Mars*. Houghton, Mittlin.
- Lowell, P. (1906). *Mars and its canals*. The Macmillan Co.
- Lowell, P. (1908). *Mars as the abode of life*. The Macmillan Co.
- Mayor, M., & Queloz, D. (1995). A Jupiter-mass companion to a solar-type star. *Nature*, 378(6555), 355-359. <https://doi.org/10.1038/378355a0>
- McCoy, T. (2023, September 6). In U.S., most UFO documentation is classified. Not so in other countries. *Washington Post*. <https://www.washingtonpost.com/world/2023/09/06/ufo-brazil-documents-classified/>
- Mellon, C. (2022, September 1). The paradox of Fermi's paradox. *The Debrief*. <https://thedebrief.org/the-paradox-of-fermis-paradox/>
- Michels, J. (2023, September 10). UFO whistleblower Dave Grusch tells me everything. *American Alchemy*. <https://www.youtube.com/watch?v=kRO5jOa-06Qw&t=978s>
- NASA. (2023, September 14). NASA unidentified anomalous phenomena: Independent study team report. NASA. [https://www.nasa.gov/sites/default/files/atoms/files/uap\\_independent\\_study\\_team\\_-\\_final\\_report\\_0.pdf](https://www.nasa.gov/sites/default/files/atoms/files/uap_independent_study_team_-_final_report_0.pdf)
- Nature. (1969). Asledgehammer for nuts. *Nature*, 221(March 8), 899-900. <https://doi.org/10.1038/221899a0>
- Nolan, G. (2023a). People say they want evidence... X. <https://twitter.com/GarryPNolan/status/1684319629597081600>
- Nolan, G. (2023b, August 28). Legitimacy around the subject matter... X. <https://twitter.com/GarryPNolan/status/1696170429944136023>
- Nolan, G., Vallee, J. F., Jiang, S., & Lemke, L. G. (2022). Improved instrumental techniques, including isotopic analysis, applicable to the characterization of unusual materials with potential relevance to aerospace forensics. *Progress in Aerospace Sciences*, 128, 100788. <https://doi.org/https://doi.org/10.1016/j.paerosci.2021.100788>
- Office of the Director of National Intelligence. (2021, June 25). Preliminary assessment: Unidentified aerial phenomena (Unclassified).
- Office of the Director of National Intelligence. (2023a, January 12). 2022 annual report on unidentified aerial phenomena (Unclassified). Office of the Director of National Intelligence.
- Office of the Director of National Intelligence. (2023b, October 18). Fiscal year 2023 consolidated annual report on unidentified anomalous phenomena: October 2023. The Department of Defense. [https://www.aaro.mil/Portals/136/PDFs/FY23\\_Consolidated\\_Annual\\_Report\\_on\\_UAP-Oct\\_2023.pdf?ver=BmBEf\\_4EBtM-Ru9JZ6-ySuQ%3d%3d](https://www.aaro.mil/Portals/136/PDFs/FY23_Consolidated_Annual_Report_on_UAP-Oct_2023.pdf?ver=BmBEf_4EBtM-Ru9JZ6-ySuQ%3d%3d)
- Ojha, L., Troncone, B., Buffo, J., Journaux, B., & McDonald, G. (2022). Liquid water on cold exo-Earths via basal melting of ice sheets. *Nature Communications*, 13(1), Article 7521. <https://doi.org/10.1038/s41467-022-35187-4>
- Parkin, K. L. G. (2018). The breakthrough Starshot system model. *Acta Astronautica*, 152, 370-384. <https://doi.org/https://doi.org/10.1016/j.actaastro.2018.08.035>
- Petri, A. E. (2023, August 4). UFOs had their day in Congress. One strange sighting came at this California launch site. *Los Angeles Times*. <https://www.latimes.com/california/story/2023-08-04/ufo-hearing-congress-sighting-at-california-vandenberg-air-force-base>
- Phelan, M. (2023, September 16). NASA claims it has finally debunked one of the most famous UFO videos that was captured by Navy fighter jets off the coast of Florida - but not all scientists are convinced. *The Daily Mail*. <https://www.dailymail.co.uk/sciencetech/article-12523999/NASA-UFO-panel-wind-data-GO>

- FAST-GIMBAL-UAP-skeptics-simulation-weather-data.html
- Poher, C., & Vallée, J. (1975). Basic patterns in UFO observations. *13th Aerospace Sciences Meeting*. <https://doi.org/10.2514/6.1975-42>
- Project Blue Book. (1955, May 5). Special report no. 14. Air Technical Intelligence Center. <https://www.cia.gov/readingroom/docs/CIA-RDP81R00560R000100060001-5.pdf>.
- Radio 4. (2023, August 3). The world tonight. *BBC*. <https://www.bbc.co.uk/sounds/play/m001p7f5>
- Roos, D. (2020, January 15). When UFOs buzzed the White House and the Air Force blamed the weather. *History*.
- Ruppelt, E. J. (1956). *The report on unidentified flying objects*. Doubleday.
- Sampson, B. (2023, July 11). Pulsar fusion to build nuclear fusion-fueled rocket engine. *Aerospace Testing International*. <https://www.aerospacetestinginternational.com/news/space/pulsar-fusion-to-build-nuclear-fusion-fueled-rocket-engine.htm>
- Sandberg, A., Drexler, E., & Ord, T. (2018). Dissolving the Fermi paradox. *ArXiv Preprint ArXiv:1806.02404*.
- Schumer, C. (2023, December 13). It is an outrage ... X. <https://twitter.com/SenSchumer/status/1735006291808969029>
- Sforza, L. (2023, August 8). Neil deGrasse Tyson on UFO claims: 'We would know about it.' *The Hill*. <https://thehill.com/homenews/space/4174905-neil-degrasse-tyson-on-ufo-claims-we-would-know-about-it/>
- Sharp, C. (2023, December 8). Operation Kill Bill: How world-changing UFO language was killed and sliced up into little pieces. *Liberation Times*. <https://www.liberationtimes.com/home/operation-kill-bill-how-world-changing-ufo-language-was-killed-and-sliced-up-into-little-pieces>
- Shellenberger, M., Mohar, A., & Smith, P. (2023, September 25). Dozens of government UFO whistleblowers have given testimony to congress, pentagon, and inspectors general, say sources. *Public*. <https://public.substack.com/p/dozens-of-government-ufo-whistleblowers>
- Shostak, S. (2023, July 27). The truth is out there. But this UFO 'whistleblower' likely doesn't have it. *MSNBC*. <https://www.msnbc.com/opinion/msnbc-opinion/david-grusch-whistleblower-ufo-hearings-evidence-rcna96712>
- Snow, C. P. (1959). *The two cultures*. Cambridge University Press. <https://doi.org/10.1126/science.130.3373.419>
- Sturrock, P. (1999). *The UFO enigma: A new review of the physical evidence*. Warner Books.
- Swords, M. (1995). USAF-sponsored Colorado Project for the scientific study of UFOs. *1995 MUFON Symposium Proceedings*.
- Swords, M. (2000). Project SIGN and the estimate of the situation. *Journal of UFO Studies*, 7, 27–64.
- Swords, M., & Powell, R. (2012). *UFOs and government: A historical inquiry*. Anomalist Books, LLC.
- Teodorani, M. (1994). Development and use of astronomy-like devices for UFO monitoring: A research project for the study of UFO physics. *Inediti Scienza*, 76, 1–48.
- The New York Times. (1944, December 14). Floating mystery ball is new Nazi air weapon. *The New York Times*. <https://www.nytimes.com/1944/12/14/archives/floating-mystery-ball-is-new-nazi-air-weapon.html>
- The New York Times. (1960, February 28). Air forge order on "saucers" cited; Pamphlet by the inspector general called objects a "serious business." *The New York Times*. <https://www.nytimes.com/1960/02/28/archives/air-forge-order-on-saucers-cited-pamphlet-by-the-inspector-general.html>
- Todd, S. (2021). The head of NASA says life probably exists outside Earth. *Quartz*. <https://qz.com/2078505/the-head-of-nasa-says-life-probably-exists-outside-earth/>
- Twining, N. F. (1947, September 23). AMC opinion concerning "flying discs." Headquarters: Air Materiel Command. <https://s3.documentcloud.org/documents/20797978/twining-memo.pdf>
- Tyson, N. D. (2023a). Sometimes I wonder whether alien space vessels... X. <https://twitter.com/neiltyson/status/1685348601927495680>
- Tyson, N. D. (2023b). To be clear, all animal, plant, and microbial life... X. <https://twitter.com/neiltyson/status/1685101276802043904>
- U.S.C. S.2226. (2023). 118th Congress (2023-2024). The unidentified anomalous phenomena disclosure act of 2023. 118th Congress (2023-2024). [https://www.democrats.senate.gov/imo/media/doc/uap\\_amendment.pdf](https://www.democrats.senate.gov/imo/media/doc/uap_amendment.pdf)
- Vallée, J. (2008). *Dimensions: A casebook of alien contact*. Anomalist Books.
- Vallée J. F., Nolan, G., & Faggini, F. (2018). Towards multidisciplinary SETI research. Independently Published. [https://www.jacquesvallee.net/wp-content/uploads/2018/11/Towards\\_Multi-disciplinary\\_SETI\\_Research.pdf](https://www.jacquesvallee.net/wp-content/uploads/2018/11/Towards_Multi-disciplinary_SETI_Research.pdf)
- Vernet, R. (2023, July 30). Number of UFO cases documented by Brazilian Air Force... *Twitter*. <https://twitter.com/RonyVernet/status/1685696828392579074>
- Von Rennenkampff, M. (2023a, August 4). A monumental UFO scandal is looming. *The Hill*. <https://thehill.com/opinion/technology/4134891-a-monumental-ufo-scandal-is-looming/>

- Von Rennenkampff, M. (2023b, August 11). NASA's approach to UFOs appears remarkably unscientific. *The Hill*. <https://thehill.com/opinion/technology/4145247-nasas-approach-to-ufos-appears-remarkably-unscientific/>
- Waichulis, A. (2023, April 21). How many exoplanets have been discovered? *Space Explored*. <https://spaceexplored.com/2023/04/21/how-many-exoplanets-discovered/>
- Weaponized. (2023, October 17). Inside the DIAs secretive UFO investigation - Guests: Dr. James Lacatski & Dr. Colm Kelleher. *Weaponized with Jeremy Corbell & George Knapp*. <https://podcasts.apple.com/us/podcast/weaponized-with-jeremy-corbell-george-knapp/id1664299388>
- Wendling, M. (2023, June 1). UFOs: Five revelations from NASA's public meeting. *BBC*. <https://www.bbc.com/news/world-us-canada-65729356>
- Wendt, A., & Duvall, R. (2008). Sovereignty and the UFO. *Political Theory*, 36(4), 607–633. <https://doi.org/10.1177/0090591708317902>
- Westby, T., & Conselice, C. J. (2020). The astrobiological Copernican weak and strong limits for intelligent life. *The Astrophysical Journal*, 896(1), Article 58. <https://doi.org/10.3847/1538-4357/ab8225>
- Williams, M. (2016, January 26). How long would it take to travel to the nearest star? *Universe Today*. <https://www.universetoday.com/15403/how-long-would-it-take-to-travel-to-the-nearest-star/>
- Wilson, R. (1945, January 2). Balls of fire! Nazi “foo fighters” for company. *The Indianapolis Star*. <https://indystar.newspapers.com/article/the-indianapolis-star-foo-fighter/114237091/>
- Winston, R. (2002). Improving on humanity? *Nature*, 416(6883), 792–793. <https://doi.org/10.1038/416792a>
- Wolfgang, B. (2023, August 6). ‘Weird and unexplainable’: America’s top general on UFOs, the Pentagon’s search for answers. *The Washington Times*. <https://www.washingtontimes.com/news/2023/aug/6/joint-chiefs-chair-mark-milley-claims-alien-recover/>
- Yingling, M. E., Yingling, C. W., & Bell, B. A. (2023). Faculty perceptions of unidentified aerial phenomena. *Humanities and Social Sciences Communications*, 10(1), Article 246. <https://doi.org/10.1057/s41599-023-01746-3>
- Zabel, B. (2021, June 1). The 1947 Twining UFO memo still matters. *Medium*. <https://medium.com/on-the-trail-of-the-saucers/twining-memo-ufo-c719bed1d287>





ESSAY

# Coming to Terms With the Psi-Trickster

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## HIGHLIGHTS

Trickster-like characteristics prevent psi from being converted to technology, which helps to preserve its mystical aspects.

## ABSTRACT

The trickster concept has been proposed as a useful description of paranormal phenomena in response to nine decades of inconsistent experimental results and the inability to develop sustained practical applications of psi. However, the trickster of mythology is too diverse and ambiguous for scientific research. The term ‘psi-trickster’ is used here to refer to an active factor that makes psi effects inconsistent and unsustainable but can be investigated scientifically. My transition from optimism about psi experiments to reluctantly accepting the psi-trickster is described. The primary purpose of this essay is to describe strategies and options for research given the apparent psi-trickster. Strategies for dealing with the psi-trickster include: (a) hope that continued experimental research will overcome it; (b) accept the far-reaching implications of the usual assumptions for psi experiments and develop models of unconscious conflicting psi influences by many different people; (c) investigate the possibility that reliable psi effects occur in rare conditions, such as after many years of intense meditation practice; (d) propose physics-based models; and (e) consider that factors other than the motivations of living persons may be involved. Experimental psi research has the ultimate goal of converting psi to technology. Like other technologies, the most advanced development will be for military uses and for corporate profits. Spontaneous psi experiences tend to inspire a sense of meaning in life and a belief that the person’s life is watched over, similar to mystical and near-death experiences. The psi-trickster characteristics prevent psi from being converted to technology and preserve its mysterious, mystical aspects. An in-depth investigation is needed to understand how paranormal beliefs and experiences affect a person’s life and society as a whole. This is the first step in investigating the psi-trickster characteristics and should include the distribution of beliefs in the population for the full spectrum from skeptics to proponents.

## KEYWORDS

Empiricism, methodology, Psi, trickster, trickster-psi effects.



## INTRODUCTION

Many people with extensive experience investigating paranormal phenomena have proposed that anomalous effects sometimes occur but cannot be reliably controlled in experiments (Beloff, 1994; Hansen, 2001; Kennedy, 2003a; Marks, 2020; Millar, 2015; White, 1994; Walach et al., 2014). Major factors motivating this position include the continuing inconsistent results for experiments after nine decades of effort and the inability to develop sustained practical applications of psi.

George Hansen (2001) proposed the ‘trickster’ as a useful description for the properties of paranormal phenomena. The trickster concept indicates that the phenomena are sometimes strong but also inconsistent and not susceptible to reliable human control. Hansen delved extensively into research and writings in anthropology, sociology, culture, and folklore, as well as psychology. One of his main conclusions is that paranormal phenomena disrupt the established social order and reciprocally occur more frequently when the social order is disrupted. He also believes that paranormal phenomena cannot be understood in terms of individual psychology. Accordingly, the usual experiments and theories focusing on psychological variables have no hope of making real progress.

My initial reaction to Hansen’s writings was discomfort and skepticism. However, as I reflected on my knowledge and experiences with experimental parapsychology, his ideas seemed more consistent with the phenomena than any other models or theories. I had done a review article about psi being elusive (Kennedy, 2001). The next step was a review about the unsustainable nature of psi, which recognized that psi effects are sometimes strong and not elusive (Kennedy, 2003a). That review found much evidence consistent with the trickster concept. The evidence continues to grow, as described below.

A panel discussion about “Trickster Theory” was held at the 2016 Combined Convention of the Parapsychological Association (59th) and Society for Scientific Exploration (35th) in Boulder, Colorado. George Hansen presented an introduction and overview of the trickster concept. I followed George with a description of how I came to accept the trickster concept and what it means for parapsychological research. Jeffrey Kripal followed with a presentation about religion, parapsychology, and trickster ideas. The present essay is an expanded and updated version of my presentation in 2016.

The term *psi-trickster*, as used here, refers to an active factor that makes psi effects inconsistent and not susceptible to sustained, reliable human control. The writings and mythology about the trickster concept, in general, are diverse, with many different meanings that cannot be

reduced to one interpretation (Hansen, 2001). This ambiguity makes the unqualified term trickster of limited use in science. My experience with peer reviews and discussions with researchers over the years has been that using the unqualified term trickster in scientific writings promotes the invalid assumption that almost any writings and speculations about trickster mythology have scientific significance. Any scientific ideas derived from trickster mythology need to be formulated as testable hypotheses. The term *psi-trickster* is used in this context.

The primary purpose of this essay is to describe strategies and options for research given the apparent *psi-trickster* characteristics of parapsychological experiments. For background, my transition is described from being optimistic about experimental research to considering that psi manifests as a *psi-trickster*. As discussed below, some researchers are not yet ready to abandon optimism about traditional parapsychological experiments. I do not expect this essay to change their minds. Rather, my hope is that the ideas presented here may be of practical value to those who consider the *psi-trickster* model plausible and want to proceed with research.

## MY JOURNEY TO THE PSI-TRICKSTER

### Early Experiences

When I was in high school, I developed the conviction that I had a calling or destiny to do research on psychic phenomena. During my undergraduate college years, I had numerous paranormal experiences that strongly reinforced this belief and made me certain that paranormal phenomena sometimes occur (Kennedy, 2000).

I worked at the Institute for Parapsychology from 1974 to 1980. During that time, I accepted the view at the lab that experimental research was the best way to understand paranormal phenomena. Personal psi experiences such as mine were considered to be of value only to the extent that they inspired experiments.

My initial experiments included studies of physiological measures of precognitive anticipation. These were the first presentiment-type studies to be reported and I was very enthusiastic and optimistic. The goal was to demonstrate that unconscious physiological measures produced more reliable psi results than traditional experiments. However, the research did not achieve that goal.

The initial results were impressive, but soon deteriorated into chasing post hoc findings (Kennedy, 1979b). An interesting post hoc finding in one study was not confirmed in the next study, but a new post hoc finding looked interesting—but was subsequently not confirmed.

I came to the conclusion that the large amount of existing research needed to be better understood before

new experiments could be meaningfully interpreted. Over the next few years, I did several literature reviews, including on experimenter effects and information processing in psi (Kennedy, 1978, 1979a, 1979c, 1980; Kennedy & Taddonio, 1976). The ominous implications of the widely held concept that psi was goal-oriented and independent of the complexity and information processing steps of the task were a major interest (Kennedy, 1979c; cf. 1995). I also continued to do some experimental research.

In 1980, I changed careers and did environmental work in government and nonprofit organizations for a decade. That was a very active period focused on applied science, engineering, law, and politics. Parapsychology had little significance in my life during that time and was rarely a topic of interest among the many people with whom I interacted.

### The 1990s and Later

In 1991, I changed careers again and started working in health and medical research—which was another type of applied science. This included regulated medical research that had much higher methodological standards than academic research and parapsychology.

In the 1990s, I also started thinking about parapsychology again. At that time, I had little confidence in psi experiments due to the inconsistent findings, the high potential for psi experimenter effects, and the weak methodology compared to my experience in medical research. I came to the conclusion that spontaneous paranormal experiences could provide more reliable insights about psi than did the existing experimental research. That was a significant reversal from 20 years before when I worked at the parapsychology lab.

Meta-analysis was much in favor in parapsychology in the 1990s, but appeared to have negligible value for resolving controversies about psi. Retrospective meta-analysis is a form of post hoc analysis with many methodological decisions that are susceptible to bias (Kennedy, 2013). Meta-analyses in parapsychology typically ended in unresolved debates, with each side believing that they had prevailed. Based on my experience in regulated medical research, I considered pre-registered, well-powered, formal confirmatory research as necessary to obtain convincing experimental evidence about psi (Kennedy, 2004a, 2013, 2016). That type of research was extremely rare in parapsychology.

### Elusive, Unsustainable Psi

With my background in applied science, I thought that two questions needed to be addressed: Why is psi so elusive, and what does psi do? I started looking into

the writings and ideas about the elusive, unsustainable nature of psi (Kennedy, 2001, 2003a).

In one of his last papers, John Beloff (1994, p. 7) commented that parapsychological research is a “succession of false dawns and frustrated hopes.” For a new line of research, virtually all the initial studies are reported as significant, and researchers become optimistic that a breakthrough has occurred. However, the great majority of later studies are not significant, and the reliability of psi results has not noticeably improved over the decades.

For example, Schmidt (1973) reported that the first five experiments he conducted investigating PK effects on quantum-based random number generators (RNGs) were all statistically significant. Research utilizing quantum processes was a major methodological development and justifiably inspired optimism about the future of parapsychology. Similarly, Honorton’s first six Ganzfeld experiments were all reported as significant (Honorton, 1977). However, the percentage of subsequent studies with significant results for these two lines of research has drifted in the range of 20 to 33 percent (Kennedy, 2013). That is much lower than the initial studies and than the 80 or 90 percent that is expected for adequately powered confirmatory research for a real phenomenon.

Similarly, Braud and Schlitz (1991) reported that the first three studies of direct mental influence of electrodermal activity were all significant with ten sessions. However, a later meta-analysis found that 650 sessions are needed to have statistical power of .80 for this line of research (Schmidt, 2015). Obtaining significant results for three studies with ten sessions is extremely unlikely if the effect size from the meta-analysis was applicable.

Beloff (1994, p. 7) also commented that “paranormal phenomena may be not just elusive, but actively evasive.” That expressed a key point. The failure to produce reliable psi effects was not just a passive signal in the noise problem. Capricious psi missing was a prominent symptom of this (Kennedy, 2003a). Psi missing can be interpreted as psi phenomena defiantly communicating, “*I am here, but you will not control me.*”

### Applications of Psi

It seemed obvious to me that reliable applications of psi would have been developed if parapsychologists had made any meaningful progress. Experimental research is based on a model of a signal in noise. Methods for enhancing a signal in noise are well established. If a signal in noise was actually the problem for psi research, useful applications of psi would have been developed long ago. Research would be well funded from profitable applications of psi.

Many research programs have attempted to develop applications of psi and have produced some striking instances of seemingly useful psi—including substantial financial profits. But these results could not be sustained. The researchers and/or funding sources eventually abandoned the efforts.

Targ and associates used associative remote viewing to predict silver futures. An initial series of trials was highly successful and is reported to have produced a \$120,000 profit (Broughton, 1991, p. 339). A later series of trials was also successful, but the next series produced equally strong psi missing (Targ et al., 1991, pp. 76–77). The efforts ended, and the initial research team became mired in disputes about what happened and why (Harary, 1992).

Bierman and Rabeyron (2013) attempted to find all reasonably credible efforts to use associative remote viewing for financial profits. Most of the 17 experiments they found were small exploratory series that were not published with peer review. They concluded that “most of the series led to profit, and some of them in considerable profits” (p. 13). They also noted that confirmation of these results “could be the end of the financial problems in the field of psi research” (p. 1). Unfortunately, the hope that precognition can end the financial problems for psi research has not materialized, and two more recently published experiments reported investment losses (Katz et al., 2018; Kruth, 2021).

As has been noted many times, casinos would go out of business if reliable applications of psi were developed, but casinos appear to make profits consistent with the laws of probability. Several studies attempting to predict the outcome of casino games have provided statistically significant outcomes but have not resulted in a usefully reliable application of psi (Brier & Tyminski, 1970a, 1970b; Dean & Taetzsch, 1970, Puthoff et al., 1986).

The Star Gate project to investigate using psi in government intelligence work was the most well-funded research program. The project received almost \$20 million dollars between 1972 and 1995. The initial work was sufficiently impressive to attract continued funding. The project was terminated in 1995 after a project evaluation reported the usual debates about whether psi exists and concluded that any effects were not sufficiently reliable for intelligence work (C.I.A., 1995, 2003).

A contracted project to investigate using E.S.P. to find land mines produced statistically significant results in the first few sessions, but the later sessions declined to chance, and the project was terminated (J. B. Rhine, 1971). The Sony Corporation is reported to have investigated E.S.P. for several years and found evidence that E.S.P. exists, but terminated the project when the company was

unable to develop useful applications (Huyghe, n.d.).

A similar pattern occurred with research on distant healing or intercessory prayer. A variety of small studies gave encouraging results (Dossey, 1993). However, subsequent large, well-funded (several million dollars total) studies by proponents of distant healing generally did not support the effect (Spilka & Ladd, 2013).

One noteworthy study was an N.I.H. grant for \$823,346 to investigate distant healing for glioblastoma multiforme (GBM), a very rare, highly lethal brain tumor (grant information Targ, 2000; study registration Freinkel, 2002,). In the early stages of the study, the primary investigator, Elisabeth Targ, was unexpectedly diagnosed with the rare cancer she was investigating. She died from the condition at age 40 during the study (Bronson, 2002; Davidson, 2002). One tribute to her pointed out that new cases of this type of cancer occur in only about 2 or 3 people per 100,000 annually (IONS, 2016). The possible relevance of this extreme coincidence for the psi-trickster model cannot be missed. The study was completed by Andrew J. Freinkel (2015), who concluded that “distant healing is not effective in the treatment of patients with GBM” (p. 1). The study has not been published but was presented at conventions (A manuscript is available online).

A Cochrane review of “Intercessory prayer for the alleviation of ill health” (Roberts et al., 2009/2014) had conclusions that were similar to the other efforts to demonstrate useful applications of paranormal phenomena:

These findings are equivocal, and although some of the results of individual studies suggest a positive effect of intercessory prayer, the majority do not, and the evidence does not support a recommendation either in favor or against the use of intercessory prayer. We are not convinced that further trials of this intervention should be undertaken and would prefer to see any resources available for such a trial used to investigate other questions in health care (para. 7).

Jørgensen et al., (2009) challenged these conclusions as overly positive about prayer. Their criticisms included that one of the studies was published in jest as a retroactive prayer study 4 to 10 years after the patients had died or left the hospital alive. One of the authors of another study was sent to prison for fraudulent activities, and there were various unresolved questions about the study.

### It Looks like a Psi-Trickster

The pattern from both experiments and attempted

applications is that psi effects can be striking and useful for a period of time but then defiantly seem to avoid the sustained effects that are needed for reliable use or to change the views of those with skeptical dispositions. Experimental parapsychology has remained in this state of limbo for nine decades since J.B. Rhine began conducting experiments in 1930 at Duke University. As indicated by the examples above, many millions of dollars have been invested, and the research has provided numerous promising opportunities to break out of this state—but that has not happened.

The concept of the psi-trickster captures the inconsistency of the effects and the associated state of limbo. From my perspective, the initial highly successful results for a new line of research are consistent with a combination of psi and inflated effects from exploratory methodology. Those who are more skeptically inclined interpret the initial effects as entirely due to biases from exploratory methodology (Wagenmakers et al., 2012).

Some optimists believe that the positive claims from retrospective meta-analyses will be reliably confirmed with pre-registered studies. Initial adequately powered pre-registered confirmatory experiments have not supported that optimism (Kekecs et al., 2023; Maier & Deschamps, 2018; Schlitz et al., 2021; Schlitz & Delorme, 2021). However, confirmatory research is needed for many lines of research. Ganzfeld studies with participants selected for certain characteristics is one of the most promising (Baptista et al., 2015). Caroline Watt's (2017) ongoing pre-registered prospective meta-analysis of Ganzfeld studies is an example of the methodology that is needed.

These confirmatory studies will establish whether the optimism about retrospective meta-analysis is correct or whether the psi-trickster model is more viable. If the optimism about meta-analysis is correct, reliable confirmatory results will be obtained, and that will demonstrate that the psi-trickster model is not valid for experimental psi research. If the confirmatory results are not reliably successful, that will demonstrate that the optimism about retrospective meta-analysis is misplaced and that the psi-trickster model is more viable.

Distinguishing between the psi-trickster model and the skeptical interpretation that psi does not exist will be more challenging. One possibility is that the state of limbo will continue with 20% to 35% of confirmatory studies successful, rather than the  $\leq 5\%$  expected if the skeptical interpretation is true or the  $> 80\%$  expected if the proponents of meta-analysis are correct. Improved research quality control measures that address computer programming and other unintentional errors, computer system security, and experimenter fraud will be important

when evaluating confirmatory evidence for the psi-trickster (Kennedy, 2016; cf. Kekecs et al., 2023).

From my perspective, the psi-trickster remains the most empirically viable view of psi as long as parapsychological researchers struggle for funding rather than have well-funded research programs based on profitable applications of psi.

## DEALING WITH THE PSI-TRICKSTER

I can see five possible strategies for dealing with the psi-trickster characteristics of the experimental research.

### 1. Ignore the Psi-Trickster

One strategy is to ignore the psi-trickster properties and hope that continued experimental research will eventually produce more reliable effects. However, if most of the formal confirmatory studies are not successful, the funding sources will likely stop supporting this strategy.

A major problem with this strategy is that the usual working assumptions about psi make experiments uninterpretable. The working assumptions held today by most experimental researchers are that psi is an unconscious process that is directed by human motivation and generally operates without conscious awareness and without conscious intention. And virtually everyone has potential psi ability.

I call these the Rhinean assumptions because they were present at J.B. Rhine's Duke Parapsychology Lab in the 1960s (Rhine & Associates, 1965). They were well established at the Institute for Parapsychology in 1973 when I arrived. These assumptions are the basis for presentiment-type studies (Radin & Pierce, 2015) and for Stanford's psi-mediated instrumental response (PMIR) model (Stanford, 2015).

The PMIR model takes the Rhinean assumptions to their logical conclusion of a magical power (psi) that operates in the background to make a person's wishes come true. The primary obstacles to the operation of this background psi are certain psychological conditions. The discussions of the PMIR model usually focus on individual psychology and do not consider the seemingly inevitable interactions of motivations and associated psi from many different people.

The Rhinean assumptions in full force directly lead to the conclusion that anyone who has any motivation about the outcome of a psi experiment or application can influence the outcome. This is widely recognized as making psi experimenter effects likely (Kennedy & Taddonio, 1976; Palmer & Millar, 2015), but the effects go far beyond the experimenter. For example, people who are strongly opposed to the idea of psi may suppress an experimental

outcome even though they are not consciously aware the experiment is being conducted. They would unconsciously and without awareness use psi to influence the world to conform to their motivations.

The outcome of a psi experiment may be dominated by psi from the general cultural background of attitudes and motivations about the paranormal (Kennedy, 2003a). If the Rhinean assumptions are true, psi-trickster characteristics could emerge from fluctuations in a near-balanced background of strong positive and negative motivations.

These implications from the research assumptions are virtually never considered when designing and interpreting psi experiments. The possibility that psi effects are a combined result from different people has been noted a few times (e.g., Millar, 1978; Stanford, 1978) but has not been developed.

## 2. Model a Network of Motivations

The second strategy for dealing with psi-trickster effects is to accept the implications of the Rhinean assumptions and develop mathematical models of diverse psi influences by many people. This strategy requires a better understanding of the motivations and distribution of motivations related to the paranormal than is currently available. The first step is to conduct research to better understand the distribution of motivations about the paranormal in the population.

Those who are committed to the Rhinean assumptions may consider this strategy as the obvious explanation for the psi-trickster characteristics and a useful line of research. However, I am not optimistic about the outcome. This strategy may or may not lead to falsifiable hypotheses. Also, the Rhinean assumptions have not been useful in understanding the paranormal experiences in my life. At this point, I doubt that the Rhinean assumptions have a meaningful degree of validity.

## 3. Propose Reliable Effects in Rare Conditions

Another strategy is to propose that the psi-trickster characteristics can be overcome in certain rare conditions. The conditions must be extremely rare, given that they have not become established after many decades of research.

One common hypothesis is that sustained, reliable control of psi can be attained after many years or decades of intense meditation practice, as described in various meditation traditions (Roney-Dougal, 2015). This hypothesis is difficult to test because no clear measure of meditation attainment has been developed, and those with the highest meditation attainment may not be interested

in psi experiments (Roney-Dougal, 2015). Some meditation traditions say that focusing on psi effects is counterproductive and should be avoided (Kennedy, 2004b). The psi effects supporting this hypothesis will need to be sustained, not just one or a few episodes of strong psi, as has been common for new lines of research in parapsychology.

This meditation hypothesis can easily become unfalsifiable. Failure to obtain reliable effects can always be interpreted as indicating that the practitioners were not sufficiently advanced.

## 4. Propose Physics-Based Limitations

A fourth strategy for dealing with psi-trickster effects is to propose that a physics-based principle prevents reliable psi effects. These proposals include that psi is based on nonlocal quantum entanglement or analogies with quantum entanglement (Maier et al., 2022; Walach et al., 2014). As described in these writings, the current understanding is that entanglement cannot be used to transmit signals. The capricious, unuseful properties of psi experiments are hypothesized to result from this no-signal property of quantum entanglement or analogies with this property (Maier et al., 2022; Walach et al., 2014). However, the strict no-signal principle that inspired these models must be discarded or altered if the models predict that psi can sometimes occur (Millar, 2015).

The psi-trickster characteristics appear to require information processing and decision-making that is more like a living process than like an inanimate principle of physics. A replication study produces different results than an initial study, even if the physical procedures are identical. Tracking whether a study is a replication and responding accordingly appears to require information processing. As discussed in Kennedy (2023), the term information is sometimes used in quantum physics theories as a label for unknown processes that are assumed to have information processing abilities of a living system but apparently would be in a different realm than biological life. "Because the human experience most analogous to quantum probability waves is the imagination of hypothetical futures, the attribution of information and mental properties to the quantum domain may be irresistible" (Kennedy, 2023, p. 29).

An implied realm of quasi-living information processing that operates as if it has its own agenda and makes decisions should be made explicit in presenting such models. The models based on quantum entanglement are basically hypotheses about the agenda or properties of this realm of information processing.

## 5. Consider More than Human Motivation

The fifth strategy for dealing with psi-trickster effects is to consider that psi may be directed or influenced by factors that are not the motivations of living persons. The most common popular ideas include supernatural entities such as spirits of deceased persons, angels, God(s), and karma. Other possibilities include psi effects from people in the future acting backward in time and some type of non-biological information processing capability that is currently not understood, has its own agenda, and underlies or interacts with quantum physics and/or life.

The main scientific problem with these ideas is that they are not parsimonious (Kennedy, 1994). Science progresses by accepting or favoring the simplest, most easily tested model or hypothesis that is consistent with the data. More complex, difficult-to-test models are considered only when additional data are not consistent with the simple model. The ideas about entities or processes beyond our current scientific understanding are dismissed because they are less parsimonious and more difficult to test than the assumption that psi is directed by the motivations of living persons. However, these ideas can be tested.

This research strategy focuses on identifying the apparent agenda or agendas of the factors that influence psi effects. For example, a recent line of research investigated certain ideas about how the psi-trickster might be limited based on models from quantum physics. After a series of experiments, the researchers concluded that the proposed hypothesis was not true (Walach et al., 2021). Although the outcome may not have been what the experimenters hoped, this case does demonstrate that hypotheses about a psi-trickster can be scientifically investigated.

More empirically based hypotheses about the agenda for psi-trickster can be developed by considering the question, "What does psi do?" As mentioned above, in the 1990s, I became interested in that question. An empirical approach is to ask people how they were affected by their paranormal experiences. Kanthamani and I (Kennedy & Kanthamani, 1995) did an exploratory research project that basically verified what Rhea White (1994) had previously found. The most common response from people is that their paranormal experiences tended to inspire an altered worldview, enhanced meaning in life, and spirituality.

Mystical experiences, near-death experiences, and psychic experiences all have similar aftereffects (Hood et al., 2009, pp. 347-350; Kennedy & Kanthamani, 1995; Ring, 1984; White, 1994, 1998). People feel that their life has a purpose and is guided or watched over by a high-

er power. A key point is that people typically experience the paranormal as something that happens to them, not something they do. Spontaneous experiences tend to be interpreted as psi guiding a person, whereas the Rhinean assumptions are that people guide psi with their personal motivations.

Thus, we have two fundamentally different views of psi. The view from spontaneous cases is that psi guides or influences people. This view inspires meaning in life and spirituality. The view from experimental research is that people guide psi. That view inspires applications of psi for military uses and corporate profits.

This point should be clearly understood: the ultimate goal for experimental research is to convert the paranormal into technology—and the most advanced development of the technology will be for military dominance and corporate profits. It is not an accident that the greatest funding for parapsychological research has been for military-related applications. However, I also suggest that it is not an accident that this research program was abandoned—like virtually all attempts to develop applications of psi.

The message from the psi-trickster is that converting psi to technology is not going to happen. If psi becomes technology, the mysterious, mystical, spiritual aspects will be compromised or eliminated. The psi-trickster characteristics prevent psi from becoming technology and preserve the mysterious, mystical aspects. "The question at this point is not whether psi can inspire a more spiritual worldview, but whether it does anything else" (Kennedy, 2000, p. 139).

The transformative aspects of psi are contingent upon spontaneous experiences being explicitly recognized as paranormal (Kennedy, 2000), whereas the traditional Rhinean assumption is that psi frequently operates without recognition. Although both hypotheses or agendas could be valid, the transformative, spiritual agenda has a clear place for the psi-trickster, whereas the psi-trickster is basically out of place with the traditional Rhinean assumptions.

The scientific question is: *At what point do we abandon the more parsimonious assumptions and accept that more complex, difficult-to-test models are needed?* At this point in science, simple, parsimonious phenomena have already been discovered. Phenomena that have not yet become accepted are probably more complex.

## WHERE THIS LEAVES THE FIELD OF PARAPSYCHOLOGY

People appear to be living in different worlds with regard to the paranormal. Some people are uncomfort-

able with the spiritual aspects of psi, others are uncomfortable with psi as technology, others are uncomfortable with any form of psi, others are infatuated by anything possibly paranormal, others have their beliefs based on religion, and many other people find the subject to be of no interest or relevance for their lives.

I think the most interesting and potentially productive area for research is to better understand the different worldviews about paranormal phenomena. What are those worldviews, what proportion of people hold the various worldviews, and how were the worldviews formed?

If the psi-trickster characteristics are due to human motivations, a thorough understanding of the diverse motivations related to psi is essential. The inconsistent results with experiments may reflect an inadequate understanding of the relevant motivations, including the potential cultural background of motivations and associated psi.

More generally, understanding how paranormal beliefs and experiences affect a person's life and society as a whole is an essential first step for investigating the psi-trickster characteristics and discovering the agenda or agendas of the psi-trickster.

The available research about paranormal beliefs is much too narrow. For example, questionnaire items that do not distinguish between paranormal effects as a human ability versus supernatural interventions may be ambiguous for many people and receive arbitrary responses (Kennedy, 2003b). Past research has focused on those who believe in paranormal phenomena with virtually no attempt to consider the development and strength of beliefs for skeptics. This has resulted in proponents of psi rallying around speculations about skeptics and skeptics making dubious assumptions about their own rationality and intellectual superiority (Kennedy, 2005).

The different worldviews can be very strongly held and resistant to change (Kennedy, 2005). Those who have strong beliefs are often biased about these topics. Researchers need to recognize their own biases.

However, the proportions of the population that hold strong pro or con worldviews about the paranormal are unknown. This is an important topic for research. Extreme worldviews may receive a disproportionate amount of attention. I suspect that the majority of people do not have strong opinions about paranormal phenomena and do not consider them significant in their lives.

My observation is that the worldviews about the paranormal are developed from personality dispositions, sociological, religious, and cultural factors, and life experiences. A broad interdisciplinary approach and team is needed.

## RESEARCH PROGRAM

An optimal research program would start with qualitative research, conducting in-depth, open-ended interviews with a diverse range of people. Proponents, skeptics, and those in between would be included. Participants about age 50 to 70 would be ideal to start. At this age, people have much life experience to draw upon and still have memories reasonably intact. The interviews would discuss the participants' beliefs and how those beliefs were formed, including personal experiences, innate tendencies, education, and influences from relatives, friends, books, media, and spiritual or religious groups. The strengths of various beliefs and changes over time would be included, as well as likely bidirectional causation between beliefs and experiences.

A key question is to what extent attitude toward the paranormal is based on innate personality dispositions versus environmental and cultural influences (Kennedy, 2005). At a minimum, a personality test would also be administered. Hansen's ideas about paranormal phenomena and disruption of the social order should also be considered.

Those who conduct research primarily to verify their own strongly held views should leave this initial research to others. This includes researchers who have personal discomfort with the possibility of paranormal effects, spirituality, or supernatural interventions. It also includes researchers who hold strong opinions about those who do not share their firm beliefs about paranormal phenomena or spirituality. This initial qualitative stage of research requires an open mind that allows diverse beliefs and experiences to emerge.

The interview data would be used to develop a questionnaire for wide use that covers the full range of attitudes and worldviews about paranormal phenomena. The final step would be to include questions about the different worldviews in random or representative national surveys. Another questionnaire that covers the types and aftereffects of paranormal and mystical experiences could also be developed.

This project would provide much-needed information about the distribution and degree of paranormal beliefs and skepticism and the relationships among personality dispositions, spirituality, paranormal beliefs, and paranormal experiences. Information would also be obtained about the types of paranormal experiences and the distribution and relationship among the different types of experiences. This information would be valuable to researchers, whether they are proponents or skeptics of paranormal phenomena.

The important question of whether the mystical/



spiritual aftereffects of spontaneous psi experiences primarily occur only for people with certain personality dispositions or cultural expectations could also be addressed in this and other research efforts. Research on the aftereffects of paranormal experiences remains at an exploratory stage with little information about basic questions such as the range of aftereffects, prevalences, and conditions for occurrence. Another important question is whether the factors and aftereffects associated with spontaneous experiences are different for experiences that appear to be possible psi than for experiences that appear to be misinterpreted as psi. Examination of reports of spontaneous psi experiences has found that about 70% to 80% of the reported experiences appear to be misinterpretations rather than possible psi (Kennedy, 2005).

More generally, my working assumption now is that there is not just one scientifically correct worldview about paranormal phenomena. Similar to the different personalities that are applicable for different people, different worldviews about psi may be applicable and valid for different people. In effect, the agenda of the psi-trickster is different for different people. It appears to me that, for all practical purposes, people do live in different worlds with regard to the occurrence and nature of these phenomena.

## IMPLICATIONS AND APPLICATIONS

The psi-trickster model is consistent with the history of parapsychology. If pre-registered, adequately powered confirmatory research does not produce reliably successful results, the inevitable conclusion will be that parapsychological experimenters do not have a meaningful understanding of a real phenomenon. Interest in the psi-trickster ideas will continue to increase, and the focus of research will shift to spontaneous cases. The proposed in-depth investigation of the diverse beliefs, worldviews, and experiences related to paranormal phenomena, including by skeptics, is needed to understand the occurrence and aftereffects of spontaneous paranormal experiences and to understand the motivations that are assumed to determine the psi effects in experiments. This research may allow inferences about the agenda or agendas of the psi-trickster. The practical implications of the psi-trickster characteristics will depend on the agenda or agendas. The available evidence suggests that a significant component of the agenda is to inspire altered worldviews and enhanced meaning in life and spirituality. With this agenda, spontaneous experiences are specifically intended to be recognized as paranormal. The traditional assumption in parapsychology that psi has a significant unnoticed role in life may have little

applicability if the primary purpose of psi is individual transformation.

## REFERENCES

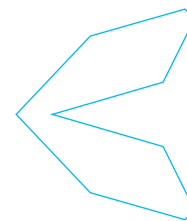
- Baptista, J., Derakhshani, M., & Tressoldi, P. E. (2015). Explicit anomalous cognition: A review of the best evidence in ganzfeld, forced-choice, remote viewing, and dream studies. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A Handbook for the 21st Century* (pp. 1-20). McFarland.
- Beloff, J. (1994). Lessons of history. *Journal of the American Society for Psychical Research*, 88, 7-22.
- Bierman, D. J., & Rabeyron, T. (2013). Can psi research sponsor itself? Simulations and results of an automated ARV-casino experiment. Paper presented at the 56th Annual Convention of the Parapsychological Association, Viterbo, Italy. Retrieved from <https://www.academia.edu/16693484>
- Braud, W. G., & Schlitz, M. J. (1991). Consciousness interactions with remote biological systems: Anomalous intentionality effects. *Subtle Energies*, 2(1), 1-46.
- Brier, R. M., & Tyminski, W. V. (1970a). Psi application: Part I. A preliminary attempt. *Journal of Parapsychology*, 34, 1-25.
- Brier, R. M., & Tyminski, W. V. (1970b). Psi application: Part II. The majority-vote technique—analysis and observations. *Journal of Parapsychology*, 34, 26-36.
- Bronson, P. (2002). A prayer before dying. *Wired*. Retrieved from <https://web.archive.org/web/20171017093740/https://www.wired.com/2002/12/prayer/>
- Broughton, R. S. (1991). *Parapsychology: The controversial science*. Ballantine Books.
- CIA. (1995). Star Gate - Final response to C.D.A. Retrieved from <https://www.cia.gov/readingroom/document/cia-rdp96-00791r000100150001-1>
- CIA. (2003). C.I.A. response to C.D.A., Highlights of 27 March status briefing (slides). Retrieved from <https://www.cia.gov/readingroom/document/cia-rdp96-00791r000200080001-8>
- Davidson, S. (2002). Does prayer really work? Retrieved from <https://www.saradavidson.com/does-prayer-really-work>
- Dean, D., & Taetzsch, R. (1970). Psi in the casino: Taetzsch method. In W. G. Roll, R. L. Morris, & J. D. Morris (Eds.), *Proceedings of the Parapsychological Association: Number 7, 1970* (pp. 14-15). Parapsychological Association.
- Dossey, L. (1993). *Healing words: The power of prayer and*

- the practice of medicine*. HarperSanFrancisco.
- Freinkel, A. (2002). Efficacy of distant healing in glioblastoma treatment. *ClinicalTrials.gov*, Identifier NCT00029783. Retrieved from <https://www.clinicaltrials.gov/ct2/show/NCT00029783>
- Frienkel, A. (2015). G.B.M. - Distance healing. <https://dx.doi.org/10.13140/RG.2.1.4560.2000>
- Hansen, G. P. (2001). *The trickster and the paranormal*. Xlibris Corporation.
- Harary, K. (1992). The goose that laid the silver eggs: A criticism of psi and silver futures forecasting. *Journal of the American Society for Psychical Research*, 86, 375–409.
- Honorton, C. (1977). Psi and internal attention states. In B. B. Wolman (Ed.), *Handbook of parapsychology* (pp. 435–472). Van Nostrand Reinhold.
- Hood, R. W., Hill, P. C., & Spilka, B. (2009). *The psychology of religion: An empirical approach* (4th ed.). Guilford Press.
- Huyghe, P. (n.d.). How Sony proved that E.S.P. is real. Retrieved from <https://web.archive.org/web/20210520053602/http://www.mindpowernews.com/DreamFactory.html>
- IONS. (2016). Elisabeth Targ. Retrieved from <https://web.archive.org/web/20160610104148/http://www.notic.org/directory/person/elisabeth-targ>
- Jørgensen, K. J., Hróbjartsson, A., & Gøtzsche, P. C. (2009). Divine intervention? A Cochrane review on intercessory prayer gone beyond science and reason. *Journal of Negative Results in BioMedicine*, 8(7), 1–4. <https://doi.org/10.1186/1477-5751-8-7>
- Katz, D. L., Grgic, I., & Fendley, T. W. (2018). An ethnographical assessment of Project Firefly: A yearlong endeavor to create wealth by predicting FOREX currency moves with associative remote viewing. *Journal of Scientific Exploration*, 32(1), 21–54. [https://www.scientificexploration.org/docs/32/jse\\_32\\_1\\_Katz.pdf](https://www.scientificexploration.org/docs/32/jse_32_1_Katz.pdf)
- Kekecs, Z., Palfi, B., Szaszi, B., Szecsi, P., Zrubka, M. et al. (2023). Raising the value of research studies in psychological science by increasing the credibility of research reports: The Transparent Psi Project. *Royal Society Open Science*, 10, Article 191375. <https://doi.org/10.1098/rsos.191375>
- Kennedy, J. E. (1978). The role of task complexity in P.K.: A review. *Journal of Parapsychology*, 42, 89–122. <https://jeksite.org/psi/jp78.pdf>
- Kennedy, J. E. (1979a). Consistent missing: a type of information-processing error in E.S.P. *Journal of Parapsychology*, 43, 113–128. <https://jeksite.org/psi/jp79b.pdf>
- Kennedy, J. E. (1979b). Possible paranormal components of anticipation: Psychophysiological explorations. *Journal of Parapsychology*, 43, 360–363 (Abstract). Full paper at <https://jeksite.org/psi/cnv1.pdf>.
- Kennedy, J. E. (1979c). Redundancy in psi information: Implications for the Goal-Oriented Hypothesis and for the Application of Psi. *Journal of Parapsychology*, 43, 290–314. <https://jeksite.org/psi/jp79.pdf>
- Kennedy, J. E. (1980). Information processing in E.S.P.: A survey of forced-choice experiments using multiple-aspect targets. *Journal of Parapsychology*, 44, 9–34. <https://jeksite.org/psi/jp80.pdf>
- Kennedy, J. E. (1994). Exploring the limits of science and beyond: Research strategy and status. *Journal of Parapsychology*, 58, 59–77. <https://jeksite.org/psi/jp94.pdf>
- Kennedy, J. E. (1995). Methods for investigating goal-oriented psi. *Journal of Parapsychology*, 59, 47–62. <https://jeksite.org/psi/jp95.pdf>
- Kennedy, J. E. (2000). Do people guide psi or does psi guide people? Evidence and implications from life and lab. *Journal of the American Society for Psychical Research*, 94, 130–150. <https://jeksite.org/psi/jaspr00.pdf>
- Kennedy, J. E. (2001). Why is psi so elusive? A review and proposed model. *Journal of Parapsychology*, 65, 219–246. Available at <https://jeksite.org/psi/jp01.pdf>
- Kennedy, J. E. (2003a). The capricious, actively evasive, unsustainable nature of psi: A summary and hypotheses. *Journal of Parapsychology*, 67, 53–74. <https://jeksite.org/psi/jp03.pdf>
- Kennedy, J. E. (2003b). The polarization of psi beliefs: Rational, controlling, masculine skepticism versus interconnected, spiritual, feminine belief. *Journal of the American Society for Psychical Research*, 97, 27–42. <https://jeksite.org/psi/jaspr03.pdf>
- Kennedy, J. E. (2004a). A proposal and challenge for proponents and skeptics of psi. *Journal of Parapsychology*, 68, 157–167. <https://jeksite.org/psi/jp04.pdf>
- Kennedy, J. E. (2004b). What is the purpose of psi? *Journal of the American Society for Psychical Research*, 98, 1–27. <https://jeksite.org/psi/jaspr04.pdf>
- Kennedy, J. E. (2005). Personality and motivations to believe, misbelieve, and disbelieve in paranormal phenomena. *Journal of Parapsychology*, 69, 263–292. <https://jeksite.org/psi/jp05.pdf>
- Kennedy, J. E. (2013). Can parapsychology move beyond the controversies of retrospective meta-analysis.

- Journal of Parapsychology*, 77, 21-35. <https://jeksite.org/psi/jp13a.pdf>
- Kennedy, J. E. (2016). Is the methodological revolution in psychology over or just beginning? *Journal of Parapsychology*, 80, 56-68. <https://jeksite.org/psi/jp16.pdf>
- Kennedy, J. E. (2023). The nature and meaning of information in biology, psychology, culture, and physics. *OSF Preprints*. <https://doi.org/10.31219/osf.io/6vgxa>
- Kennedy, J. E., & Kanthamani, H. (1995). An exploratory study of the effects of paranormal and spiritual experiences on people's lives and well-being. *Journal of the American Society for Psychical Research*, 89, 249-264. <https://jeksite.org/psi/jaspr95a.pdf>
- Kennedy, J. E., & Taddonio, J. L. (1976). Experimenter effects in parapsychological research. *Journal of Parapsychology*, 40, 1-33. <https://jeksite.org/psi/jp76.pdf>
- Kruth, J. G. (2021). Associative remote viewing for profit: Evaluating the importance of the judge and the investment instrument. *Journal of Scientific Exploration*, 35(1), 13-35. <https://doi.org/10.31275/20211395>
- Maier, M. A., & Dechamps, M. C. (2018). Observer effects on quantum randomness: Testing micro-psychokinetic effects of smokers on addiction-related stimuli. *Journal of Scientific Exploration*, 32(2), 265-297. <https://doi.org/10.31275/2018.1250>
- Maier, M. A., Dechamps, M. C., & Rabeyron, T. (2022). Quantum measurement as pragmatic information transfer: Observer effects on (s)objective reality formation. *Journal of Anomalous Experience and Cognition*, 2(1), 6-48. <https://doi.org/10.31156/jaex.23535>
- Marks, D. F. (2020). *Psychology and the paranormal: Exploring anomalous experience*. Sage. <https://doi.org/10.4135/9781529730036>
- Millar, B. (1978). The observational theories: A primer. *European Journal of Parapsychology*, 2, 304-332.
- Millar, B. (2015). Quantum theory and parapsychology. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st Century* (pp. 1-20). McFarland.
- Palmer, J., & Millar, B. (2015). Experimenter effects in parapsychological research. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st Century* (pp. 1-20). McFarland.
- Puthoff, H. E., May, E. C., & Thompson, M. J. (1986). Calculator-assisted psi amplification: II. Use of the sequential-sampling technique as a variable-length majority-vote procedure. In D. H. Weiner & D. I. Radin (Eds.), *Research in parapsychology 1985* (pp. 73-77). Scarecrow Press.
- Radin, D., & Pierce, A. (2015). Psi and psychophysiology. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st Century* (pp. 1-20). McFarland.
- Rhine, J. B. (1971). Location of hidden objects by a mandog team. *Journal of Parapsychology*, 35, 18-33.
- Rhine, J. B., & Associates. (1965). *Parapsychology from Duke to FRNM*. Parapsychology Press. <https://doi.org/10.1126/science.149.3687.910>
- Ring, K. (1984). *Heading toward omega*. William Morrow.
- Roberts, L., Ahmed, I., & Davison, A. (2009/2014). Intercessory prayer for the alleviation of ill health. *The Cochrane Library*. <https://doi.org/10.1002/14651858.CD000368.pub3>
- Roney-Dougal, S. M. (2015). Ariadne's thread: Meditation and psi. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st Century* (pp. 1-20). McFarland.
- Schlitz, M., & Delorme, A. (2021). Examining implicit beliefs in a replication attempt of a time-reversed priming task [version 2; peer review: 2 approved]. *F1000Research*, 10, Article 5. <https://doi.org/10.12688/f1000research.27169.2>
- Schlitz, M., Bem, D., Marcusson-Clavertz, D., Cardeña, E., et al. (2021). Two replication studies of a time-reversed (psi) priming task and the role of expectancy in reaction times. *Journal of Scientific Exploration*, 35(1), 65-90. <https://doi.org/10.31275/20211903>
- Schmidt, H. (1973). P.K. tests with a high-speed random number generator. *Journal of Parapsychology*, 37, 105-118.
- Schmidt, S. (2015). Experimental research on distant intention phenomena. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st Century* (pp. 1-20). McFarland.
- Spilka, B., & Ladd, K. L. (2013). *The psychology of prayer: A scientific approach*. Guilford Press.
- Stanford, R. (1978). Toward reinterpreting psi events. *Journal of the American Society for Psychical Research*, 72, 197-214.
- Stanford, R. (2015). Psychological concepts of psi function: A review and constructive critique. In E. Cardeña, J. Palmer, & D. Marcusson-Clavertz (Eds.), *Parapsychology: A handbook for the 21st Century* (pp. 1-20). McFarland.
- Targ, E. F. (2000). Efficacy of distant healing in glioblastoma treatment. Retrieved from <https://grantome.com>

com/grant/NIH/R01-AT000644-01

- Targ, R., Braud, W. G., Stanford, R. G., Schlitz, M. J., & Honorton, C. (1991). Increasing psychic reliability. *Journal of Parapsychology*, 55, 59–83.
- Wagenmakers, E.-J., Wetzels, R., Borsboom, D., van der Maas, H. L. J., & Kievit, R. A. (2012). An agenda for purely confirmatory research. *Perspectives on Psychological Science*, 7(6), 632–638. <https://doi.org/10.1177/1745691612463078>
- Walach, H., Lucadou, W. v., & Römer, H. (2014). Parapsychological phenomena as examples of generalized nonlocal correlations—A theoretical framework. *Journal of Scientific Exploration*, 28(4), 605–631. [https://www.scientificexploration.org/docs/28/jse\\_28\\_4\\_Walach.pdf](https://www.scientificexploration.org/docs/28/jse_28_4_Walach.pdf)
- Walach, H., Kirmse, K. A., Sedlmeier, P., Vogt, H., Hinterberger, T., & Lucadou, W. v. (2021). Nailing jelly: The replication problem seems to be unsurmountable. Two failed replications of the matrix experiment. *Journal of Scientific Exploration*, 35(4), 788-828. <https://doi.org/10.31275/20212031>
- Watt, C. (2017). A prospective meta-analysis of pre-registered ganzfeld E.S.P. studies. *K.P.U. Study Registry*, study ID number 1024. Retrieved from [https://www.koestler-parapsychology.psy.ed.ac.uk/Documents/KPU\\_Registry\\_1024.pdf](https://www.koestler-parapsychology.psy.ed.ac.uk/Documents/KPU_Registry_1024.pdf)
- White, R. A. (Ed.). (1994). *Exceptional human experience: Background papers I*. Exceptional Human Experience Network.
- White, R. A. (Ed.). (1998). *Exceptional human experience: Special issue. Background papers II. The E.H.E. Network, 1995-1998: Progress and Possibilities*. Exceptional Human Experience Network.



ESSAY

# Medicine, Money, and Media: A Case Study of How the Covid-19 Crisis Corrupts Disclosure and Publishing Ethics

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## HIGHLIGHTS

Two specific academic controversies suggest that financial conflicts of interest can distort research and influence evaluations of the COVID-19 pandemic.

## ABSTRACT

We present a case study of corrupted discourses in medicine. Medicine is a fallible science. Therefore, it is not surprising that mistakes in the assessment of data and early closure of discourse have led to a highly biased view of the Covid-19 crisis. We present two examples of papers which were retracted following criticisms and republished after a lengthy re-reviewing process. One paper discussed the clinical benefits of COVID-19 vaccinations and the potential risk profile of these vaccinations using the Dutch Adverse Drug Reaction Register. The results of this study were not very favorable. The pressure mounted on the publisher of the journal *Vaccines* (MDPI, Basel) was huge, and the paper was retracted, although none of the classical reasons for retraction were present. The second paper was about carbon dioxide content in inhaled air under face masks in children, which revealed amounts of CO<sup>2</sup> inhaled under masks that violate accepted security norms by a factor of six. This paper was also retracted after criticisms were raised online and after a very dubious re-review process. A closer analysis shows that both retractions were politically motivated. We analyze these case studies and conclude that in the era of COVID-19, politics and financial incentives are increasingly replacing scientific discourse. The profit motive in scientific discourse has opened the floodgates to political influences. This makes obvious what has long been a problem: Financial conflicts of interest continue to distort research and play a major role in evaluations of the COVID-19 pandemic.

## KEYWORDS

COVID-19, retraction, conflict of interest, publishing, ethics, peer-review.

## INTRODUCTION

The appearance of the coronavirus SARS-CoV2 on the world stage at the end of 2019 (Gorbalenya et al., 2020; Ren et al., 2020; Zhu et al., 2020) and its denomination as a pandemic by the WHO on 11th March 2020

(Hua & Shaw, 2020; World Health Organization, 2020) can be seen as historic events. The SARS-CoV-2 pandemic not only created challenges for health systems around the globe. It also produced clefts within families, social groups, academia, political leadership, and it engendered

ensorship in ways previously not encountered (Shir-Raz et al., 2022). We want to focus on the cleavage and faction that were produced in the academic world. Since most governments claimed that their actions were based on ‘what science tells us’, and on the ‘evidence’ derived from science, especially those in Western societies, it becomes mandatory to scrutinize, whether science can indeed be the unbiased arbiter so many people take it to be. To give a short answer: no, it cannot. The reasons for this are multifaceted, and we will provide some of them. Especially, we will present our experience with the publication of two critical articles which were seen by conflicted reviewers as ‘trash’ and withdrawn under political pressure, only to be later republished. This is a case study of science in ‘real-time’ operating mode. Our argument is, by necessity, biased by our own personal experiences and viewpoints. In the tradition of reflexivity as an important methodological guidepost in the social sciences, we are happy to lay them open up front, as much as we are aware of them.

### The Mainstream Narrative about Covid-19

We were critical of the mainstream narrative at the outset, which comprised, among others, the following viewpoints:

There is a novel virus outbreak, SARS-CoV2. It comes from a zoonotic source, i.e., it is of animal origin and has jumped the barrier, now infecting humans. It is extremely dangerous because no immunity exists against it because it is highly infectious and produces a high infection fatality rate (IFR, i.e., the ratio of those who will die as a consequence of the infection in proportion to those infected). To prove this, the media presented us with anxiety-raising pictures of dying people, coffins, crammed hospitals, and a completely cordoned multi-million city, Wuhan, in China. The “killer-virus” meme was activated and various governments, certainly the German government, started to operate by raising people’s fear level. Raising the fear level as one of the necessary measures was part of a Governmental briefing paper drafted in March 2020 and entitled “Learning from China” ([https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/2020/corona/szenarienpapier-covid19.pdf?\\_\\_blob=publicationFile&v=6](https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/2020/corona/szenarienpapier-covid19.pdf?__blob=publicationFile&v=6), accessed 16<sup>th</sup> July 2021). This government paper suggested appealing to the fear of suffocation or by briefing the press with fear-directed messages only.

The dashboards that sprung up in various places counting fatalities and cases around the world contributed to the allegedly science-based information about epidemiological figures and spread. But the consequences were, among others, narrow territorial management

strategies and promotion of anxiety (Everts, 2020; Wolf, 2022, pp. 103-117). Precisely because there is no immunity and the virus will infect each and every one if not prevented, it was stated very early that there is only one hope: rapid development and deployment of vaccines and until then harsh measures, called ‘non-pharmaceutical interventions’ (NPIs). For instance, German Chancellor Merkel stated in April 2020: Without a vaccination, the pandemic won’t go away, and we would need NPIs (<https://www.welt.de/politik/deutschland/article207167375/Merkel-zu-Corona-Solange-wir-keinen-Impfstoff-haben-wird-das-gelten.html>, accessed 13/11/2023). Since traditional corona-virus vaccines have not been very effective in the past (Tseng et al., 2012), new technology would need to be employed, either vector vaccines that will transport immunogenic portions of the virus directly to cells via another, purportedly benevolent virus, or by modified messenger RNA vaccines that would program target cells to express the immunogenic parts of the virus, enticing the immune system to produce antibodies. Since normal vaccine development processes take at least four, more realistically, 6 to 10 years, there would only be a chance to get immunization to the people if we break our standards, forsake the normal sequence, and allow deployment before we have good safety data.

We identify a conglomerate of the following elements as part of the narrative, which we call the ‘mainstream narrative’, which we have also integrated into a questionnaire measuring the adherence to this narrative (Walach, Ofner, et al., 2022; Walach, Ruof, et al., 2021):

- A highly infectious agent with;
- A higher than usual IFR against which nobody is resistant because;
- No immunity exists, and hence;
- Severe NPIs are the only method to prevent the spread until;
- Novel vaccines are developed at high speed, even at the cost of safety.

We became critical of this mainstream narrative for different reasons early in 2020. Rainer J. Klement, a multidisciplinary natural scientist with a Ph.D. in physics, became suspicious about the media fear campaign, the denunciation of individuals questioning the mainstream narrative and its inherent reductionism completely ignoring self-responsibility and an intact immune system from the very beginning (Klement, 2020a, 2020b, 2020c). He also began to study test accuracy and noted that the PCR-test employed was too unspecific, producing too many false positives (Klement & Bandyopadhyay, 2020). Together with virological and other specialists, he queried

the solidity of the original PCR-test published by Drosten's group (Borger et al., 2020; Corman et al., 2020; Klement, 2020b, 2020c; Klement & Bandyopadhyay, 2020). This test was submitted on January 21<sup>st</sup>, 2020, accepted on January 22<sup>nd</sup>, and published on January 23<sup>rd</sup>, 2020, and hence probably holds the record in speeding through peer review of all scientific papers published.

Harald Walach, a health researcher active mainly in complementary aspects of health research, mindfulness, and some theoretical issues, is trained with a Ph.D. in clinical psychology and with a second Ph.D. in history and theory of science. He has conducted many experimental, clinical, and observational studies in the health field, taught methods classes, and has ample experience analyzing all kinds of data. He looked at the data that were publicly provided in Germany to check whether the public messages on TV and in print media were in consonance with the data. He discovered early on that the models which informed decision making (an der Heiden & Buchholz, 2020; Ferguson et al., 2020) made the crucial assumption that the IFR is comparatively high and that at least 70-80% of the population are susceptible. Using these assumptions, these models derived estimates of up to 2.5 million future fatalities for the US and 400,000 to 500,000 for Germany and the UK if no NPIs were put in place. He pointed out in Blogs and some smaller published pieces that the actual data do not fit the mainstream narrative (Kuhbandner et al., 2020b, 2022; Walach & Hockertz, 2020a, 2020b). Trying to raise this point with officials at the Robert Koch Institute in Germany, the official office of public health, or with state officers of the ministries of the interior or health was unsuccessful. Nobody wanted any dialogue, as the frontiers seemed to have been already established between those who "believed" the mainstream narrative and those who didn't. We did not.

### A Note on the Fallibility of Medicine as a Scientific Discipline

The public, some medical researchers, and MDs often take medicine to be a 'science', in the sense that physics, chemistry, or engineering are sciences: based on sound and proven theories with clear models and quantitative predictions that can be empirically confirmed (or falsified depending on one's inclination towards Popper), with clear procedures and benchmarks to settle disputes about what is and is not true or evidence-based. Unfortunately, this view of medicine as a basic science is a myth. The reason is that medicine deals with humans who are complex and adaptive open systems, meaning that the causal processes acting on and within them strongly de-

pend on the context, on differential genetic conditions and initial values, and cannot be explained by simply studying individual parts (Ahn et al., 2006; Greenhalgh & Worrall, 1997; Klement & Bandyopadhyay, 2019; Sturmborg & Martin, 2021). Simple, causal, and linear thinking is appropriate for emergency purposes in medicine, where it works well, for instance, when a broken leg has to be stabilized or bleeding has to be stilled. But in more complex situations, this simple logic fails.

This basically means that an intervention that works in one context may not work in another, or more generally, that no strict regularities and predictions are possible; at best, probabilistic predictions can be made that do not necessarily apply to an individual patient. Unfortunately, instead of acknowledging these limitations, medicine often behaves as if it deals with closed systems that are isolated from their environment. Theoreticians of medicine have now and again clarified that medicine is a practical discipline that makes use of insights from the natural sciences, as well as from other disciplines, but it isn't a natural science itself (Collins & Pinch, 2005; Loughlin et al., 2013; Meyer-Abich, 2010; Miles & Asbridge, 2014; Uexküll, 1995; Uexküll & Wesiack, 1988; Wieland, 1975). In the same vein, what works in medicine is less a matter of data only but also of experience, common sense, plausibility, and *horrible dictu*, economic interests (Abbasi, 2020; Gabbay & le May 2004; Gill et al., 2020; Gøtzsche, 2019; Ioannidis, 2018). How else would it be conceivable that a discipline in which probably less than half of all interventions are really based on scientific evidence (El Dib et al., 2007; Howick et al., 2022), a ratio that has not increased appreciably over the last decade (Howick et al., 2020), can function appropriately? Our recent meta-epidemiological study found that of 1,567 interventions randomly chosen from the Cochrane Database of Systematic Reviews – about a third of all interventions studied since 2008 – only 5.6% had solid, high-quality evidence of efficacy. There were indications for harm in 8% of all interventions. (Howick et al., 2022)

Medicalization of everyday life and the myth-making of modern medicine as the savior from sure impending death has led to a collective clouding of critical reasoning. For instance, while every new drug on the market is hailed by the public and media alike, the fact that side effects due to medications are the third leading cause of death in modern Western societies (Gøtzsche, 2013, 2015; Makary & Daniel, 2016) is not widely known and mostly ignored.

One of the most frequently cited papers in the modern medical literature is John Ioannidis' "Why most published research findings are false," meaning most *medical* research findings (Ioannidis, 2005). It is telling for the standing of a discipline that a paper critiquing its empiri-

cal base is one of the most frequently cited ones. It is seconded by Richard Horton's admonishing question, "*What is medicine's 5 sigma?*" (Horton, 2015). Here, the editor of *Lancet*, one of the leading medical journals, points out that there is no process of robustly defining a scientific "fact" within medicine comparable to physics, which uses the jointly replicated significance threshold of five standard deviations to accept something as proven. Perhaps Horton has read Ludwik Fleck, whose findings around thinking style and scientific collectives can be summarized into the adage: *A scientific fact is an agreement to stop thinking* (Fleck, 1979).

This construing of a fact that happened briefly during the swine flu pandemic that never was one; here, we see some of the patterns of medical fraud, including some 'experts' with large media coverage, financial conflicts of interest of leading authorities and biased media reporting (Keil et al., 2011). In our opinion, this example shows an uncanny similarity to today's Covid-19 crisis. Some individuals in Germany, such as Christian Drosten, the inventor of the first PCR test for SARS-CoV2, and some minor players that were on the cover of print and TV media nearly at a daily rate, commented on the making of the story. Some data were quickly concocted and often quickly put through the review process, published in respectable journals, they dominated the interpretative framework, and were taken up by the media.

A political spin was quickly added: those governments that were considered progressive, democratic, and representative of the Western model of enlightenment acted harshly and decisively. Thus, it was not only scientific evidence and truth that was at stake but political correctness. There were those who "believed" the official story, the mainstream narrative. This was propagated through all channels of public and print media and was only criticized by alternative internet media in the public domain. These were the predominant outlets for critics of the mainstream narrative. They were, in turn, blemished as 'right-wing', 'reactionary', or 'conspiracy theoretical' by self-appointed fact-checkers and alpha journalists (Krüger, 2013) in mainstream media. Thus, the critical discourse about the facticity of the mainstream narrative was sidelined and marginalized in news outlets, and even censorship was commonplace (e.g. <https://www.aei.org/op-eds/missouri-v-biden-and-the-crossroads-of-politics-censorship-and-free-speech/>; <https://www.racket.news/p/in-missouri-v-biden-internet-censorship>, accessed 13/11/2023). It became difficult even to hold diverging opinions in public without being personally attacked (Shir-Raz et al., 2022). A colleague of ours posted critical Tweets as Dr. John B. His Twitter account has been shut down after he reached some 60,000 followers and

millions of visits (personal communication). He is a highly reputed scientist at an Eastern European university who has formed a critical consortium. This consortium operated anonymously because the universities had threatened to penalize all who uttered opinions divergent from the official line publicly.

In the scientific arena, something similar happened: The influential journals carried mainly pieces that transported and supported the official narrative, while critical data was often sidelined into second- or third-tier journals or saw a considerable delay in publication. Mainstream media outlets rarely reported on scientific data critical of the mainstream narrative. For instance, we criticized the influential paper of a working group of the Max-Planck-Institute in Göttingen that had justified the German lock-down-politics using wrong data (Dehning, Zierenberg et al., 2020). Our critique led to the group's admitting that their data was not adequate (Dehning, Spitzner et al., 2020; Kuhbandner et al., 2020a, 2020b). But none of the mainstream media in Germany took up this criticism. Until it was finally published two years later, four different review processes and three rejections passed (Kuhbandner et al., 2022). The same is true for the model that supported the beneficial effects of vaccinations (Watson et al., 2022): It was published in a high-impact journal. Our criticism was rejected as a Letter by various journals until it was published with more than a year delay (Klement & Walach, 2023). None of the German language mainstream media picked up on this criticism. These are, admittedly, personal experiences. But it seems that this pattern was quite universal: Mainstream media propagated the findings published in high-impact journals, while critical voices in the media were sidelined into novel internet media outlets, which were all too often the only ones reporting on critical findings that had mostly been published in second and third tier scientific journals.

Often, the counterargument is raised: If public opinion was not controlled and if an unrestrained discourse were allowed, political action would be diluted, the attempt to control the pandemic would be hampered, and lives would be at risk. We offer here a simple question as food for thought: If there had really been a deadly universal threat, would there not have been a comparatively quick agreement, both among scientists and the public? Is not the fact that a sizeable portion of both civil society and the scientific community hold diverging opinions a clear sign that something is wrong with the mainstream narrative? For instance, in our review of immunologists, a third of immunologists did not support this mainstream view, and a majority thought that the immune system and its competence were more important than the virus and its virulence (Walach, Ruof et al., 2021).



If a real threat were hovering outside, nobody would have to be told to remain at home or wear masks in public. They would know. Workers who go to work in indispensable jobs would have to be collected by police to do their work. We submit that the mere fact that there is a sizeable portion of the academic and civic community holding diverging opinions is a sign of the weakness of the mainstream narrative, which appears deeply flawed to some. For instance, quite early on, three highly reputed professors published the Great Barrington Declaration (<https://gbdeclaration.org/>, accessed 13/11/2023) on Oct 4<sup>th</sup>, 2020, which quickly had more than 50.000 signatories and, to date, carries more than 900.000 signatures. It was quickly dismissed by most mainstream media, its authors were character assassinated by some media, and the message went largely unheard.

The scandal is not that the flaw of the mainstream narrative is not seen by all. The scandal is that discourse about this flaw is not possible, not even among scientists. The instruments to prevent discourse are peer review, peer pressure, institutional penalization, fact bending, and outright lying by the media, as well as heavy pressure on journals not to publish opinions and facts that are dissenting (Shir-Raz et al., 2022). Another powerful instrument to penalize dissenting opinions and incentivize conformity is retractions (Elisha et al., 2022). We report and analyze below two case studies of our own research being retracted.

### Case Study 1: Retracted: Walach, Klement & Auke- ma (2021)

Harald Walach and Rainer J. Klement made contact with Wouter Aukema, who is an independent data analyst. He started to analyze the side effects database of the European Medicine Agency when side effects of the new COVID-19 vaccines were published beginning in 2021 and posted his findings on Twitter. We decided to analyze these data more formally.

Let us remember: The normal sequence of vaccination (and medication) regulation in Germany and elsewhere was informed by the thalidomide scandal in Germany in the 1960's. Thalidomide, brand name Contergan, was marketed as a sedative, pain killer, and sleeping pill, in general, but also especially for pregnant women by the German company Chemie-Grünenthal (Ridings, 2013). If taken during a specifically sensitive time of development of the fetus during pregnancy, it causes deformities in the growth of extremities. Many children were stillborn or died early, with estimates assuming that 40% of those damaged died (Stachowske, 2014). It took many years, court cases, and political campaign pressure until this

was acknowledged, compensations paid, and as a consequence, the regulation of new pharmaceutical agents changed for medicines and vaccines alike. It now includes pre-toxicology screenings in animal models, during which new substances have to prove that they are not toxic, are not carcinogenic, and cannot produce gene defects and abnormalities in the offspring. Only if that is proven phase 1 trials of safety in humans are initiated, then small phase 2 trials of clinical efficacy and finally pivotal phase 3 trials of clinical effectiveness in large groups of patients, large enough to demonstrate differences against controls with statistical significance. Most novel agents are then submitted to compulsory post-marketing surveillance studies during which the safety in general practice is documented.

This procedure has been suspended for COVID-19 vaccines with the argument that the pandemic situation and its associated threat demand swift action (Arvay, 2020). Consequently, no solid safety data exists to this point. The fact was ignored that similar vaccines against SARS had produced severe side effects (Tseng et al., 2012) such that their development was aborted. A new procedure was invented: telescoping, to conduct all phases of vaccine developments in parallel. Thus, no safety data existed when clinical phase 3 trials started. When the first trial of the mRNA vaccine developed by BioNTech and marketed by Pfizer was published (Polack et al., 2020), Harald Walach asked Judith Absalom, the corresponding person at Pfizer, whether there were safety data. She answered "not yet" at the time (email to Harald Walach). Meanwhile, such data are being published, and they do not instill confidence in the vaccines' safety (<https://dailyclout.io/category/pfizer-reports/>, accessed 13/11/2023). Also, scientists and public health activists have freed up information via Freedom of Information Act inquiries and made the data public (<https://phmpt.org/pfizer-16-plus-documents/>, accessed 13/11/2023).

RNA and vector vaccines use novel techniques that have been around for a while but never saw the light of an economic day because they were not in any way superior to conventional techniques. In essence, they are genetically based techniques. In a conventional vaccine, a pathogen or relevant parts of it are presented to the immune system in a less pathogenic form, usually together with some immunogenic substance such as aluminum hydroxide, inducing an immune reaction. In contrast, with these new products, the RNA of the pathogen, in that case, encoding for the spike protein of the SARS-CoV2 virus, is directly inserted into human cells in a modified version (Sahin et al., 2014). This is achieved either via messenger RNA transported in nanoparticles that then is incorporated by the ribosomes, instructing them to pro-

duce the spike protein, which in turn induces an immune reaction, or via a viral vector that deposits the RNA of the virus in the cytosol of the cell, where it is transcribed into DNA and transported to the nucleus such that the spike protein is then produced. Thus, it would be more correct to term this type of intervention “preventive gene therapy”, and not vaccination. So far, we only have a theory to go by, whether this model works. The theory sounds rational and clever. The antibody-inducing properties of these procedures are proven but also not very surprising, considering the fact that these vaccines contain a multitude of micro impurities, from human to animal proteins to various kinds of nanoparticles (Kowarz et al., 2021; Krutzke et al., 2021; Seneff & Nigh, 2021).

But what we do not know is: How safe are these procedures? Again, we emphasize that there is no long-term safety data. Meanwhile, the ones we have are from comparatively small (about 20,000 participants) regulatory trials with cohorts not representative of the population that are being given those vaccines. Two recent analyses of regulatory data concluded that the vaccines produce more side effects than they prevent severe COVID-19 disease cases (Fraiman et al., 2022; Mörl et al., 2022). In addition, ethical concerns about short-term trial data have also been raised (<https://dailyclout.io/pfizer-process-2-vaccine-had-2-4-times-adverse-events/>, accessed 13/11/2023).

The only way safety can be gauged prospectively for the time being is through the adverse drug reaction (ADR) databases of regulators. These databases collect ADRs that are reported by market authorization holders, i.e., the companies that market products. These companies are legally bound to report ADRs. In addition, self-reports of patients and doctors exist in most countries. We know that this system has drawbacks, and empirical studies of the completeness of these registers found that underreporting in such registers is between 60% and 80% and can be as high as 95% (Alatawi & Hansen, 2017; Hazell & Shakri, 2006; Moore & Bennett, 2012).

This is where our study started. We sought to gauge the benefits and parallel them with the risks. In order to estimate the benefit, we calculated the Number Needed to Vaccinate (NNTV) to prevent one death from a large Israeli field study (Dagan et al., 2021) that had studied more than a million participants, half of whom had received the BioNTech m-RNA vaccine and half of them were as yet unvaccinated. The observation period was only four weeks, and ideally, one would need a much longer period. However, these data simply did not exist at the time. In order to establish the NNTV, one needs to know the absolute risk difference. That is the risk, calculated as the number of events, in our case deaths, standardized on the num-

ber of participants in the control group and subtract the risk per participants in the treated group. This figure is the absolute risk difference, which is a clinical effect. It is different from the relative risk ratio, which is the ratio of risk in the control group to the treated group, which yields the effectiveness of the vaccine. This is usually high, around 95% for different vaccines. But as the events – symptomatic illness or death – are rare events because the prevalence of SARS-CoV2 infections has always been comparatively low, one has to vaccinate many people before one event can be prevented.

This crucial point was mentioned by Olliaro and colleagues (Olliaro et al., 2021), who calculated that the study by Dagan and colleagues allows a robust calculation of the NNTV in the face of the data from the regulatory phase 3 trials. We used this Dagan et al. study to calculate the NNTV to prevent one death. The NNTV is simply the reciprocal of the absolute risk difference. And for the BioNTech vaccine, it was at the time roughly 16,000. This means that 16,000 persons would have to be vaccinated in order to prevent one COVID-19-related death. Meanwhile, we have a somewhat better database from the six month regulatory trial of the BioNTech/Pfizer vaccine (Thomas et al., 2021). There, in supplementary Table 4, death is mentioned as an additional outcome. While two Covid-19-related deaths are mentioned in the control group of 21,921 participants, one Covid-19-related death was observed in the BioNTech group ( $n = 21,926$ ). The observation period is now six months, i.e., long enough to cover what we now know is the period during which the vaccination confers a protective effect (Nordström et al., 2021). Thus, we see one death prevented in about 20,000 persons vaccinated or five deaths in 100,000 persons vaccinated. This is pretty close to our original estimate. (Walach, Klement, et al., 2022) However, the populations studied in those vaccination regulatory trials were not representative of the population at risk for COVID-19 but rather biased towards younger and healthier groups.

We then investigated the ADR database of Lareb, the Dutch health authority. We used this because we discovered that within the ADR database of the European Medicine Agency (EMA), there was a huge variability between the countries, with Poland reporting 15 side effects per 100,000 vaccinations and the Netherlands 701. Obviously, the Dutch data adhere to a better reporting standard (we dismissed the argument that the vaccine might affect different countries differently). Also, Lareb stated on their website that all reports are vetted by investigators. Using these data, one can calculate that during the time of our analysis in July 2021, we saw 4.11 fatalities per 100,000 vaccinations and about 16 severe side effects. It is clear that there is no causality attributable to these data. How-

ever, a strong association can be attributed. Otherwise, market authorization holders, doctors, and patients would not report. If one puts these two data sets in relation, also including the somewhat better figures of the phase 3 regulatory trials, one sees that 100,000 vaccinations save six to 32 lives, but at the same time, four fatalities are reported in association with these vaccinations. Thus, the risk-benefit ratio was 2:3 to 1:8 at the time. The longer observation period of the six month trial vindicated our original estimate (Thomas et al., 2021). Of course, we need to study causality carefully. This is impossible using such registers. The registers give a safety signal, which then needs to be investigated, ideally in a large cohort study of perhaps one million vaccinated people that are closely monitored by independent medical personnel for novel symptoms, side effects, etc. It is difficult to understand why the marketing authorization and clinical trials were sped through the regulation process, but no associated safety studies seem to have been inaugurated.

It is worth mentioning that an analysis of the CDC VAERS database has reached a similar conclusion: 3.4 deaths per 100,000 vaccinations (Rose, 2021). Looking at VAERS, the deaths reported there in association with COVID-19 vaccines are by roughly a factor of 100 more numerous than those with all other vaccines standardized on time (Seneff et al., 2022). We thought this should give us pause and be an incentive to install an active safety monitoring system. At the time of this analysis, the clinical trial register <https://clinicaltrials.gov/> (accessed July 18<sup>th</sup>, 2021) showed over 500 entries regarding clinical phase 3 trials of efficacy and safety but no single large-scale post-marketing surveillance study of side effects. There is a large European multicenter efficacy monitoring study which, however, does not include safety monitoring (<https://www.ecdc.europa.eu/en/publications-data/interim-analysis-covid-19-vaccine-effectiveness-against-severe-acute-respiratory>, accessed 2nd February 2022). It was in that vein that we published our paper (Walach, Klement, et al., 2021a) that, admittedly, used some harsh language to drive the message home:

We are in the midst of the largest vaccination and medical experiment ever conducted on mankind without having adequate safety data and without proper informed consent. Proper informed consent cannot be sought nor given because we do not know the risks associated with the intervention.

If one uses the data we have, which are bad data and much too short-term and unsystematic, the risk-benefit analysis is very unfriendly. In our view, this would seem to potentially call a halt to the vaccination campaigns and would surely have to trigger a careful safety analysis by independent experts; at the least, it should instigate

a concomitant *active* monitoring study in addition to the passive systems in place. In an active monitoring system, a defined large enough cohort would be followed up prospectively over a certain time period. This has been demanded by many authors but has not been implemented. Hence, we can only use the pharmacovigilance data of those databases as a proxy (Lyons-Weiler, 2021).

This was the gist of our paper. Admittedly, we did not word our claim carefully enough. In some passages, one might construe our claim as attributing causality to the deaths associated with the vaccines in the pharmacovigilance data. As the editor of the journal who republished our paper observed: if we cannot use the data of the pharmacovigilance data-bases to make at least tentative ascriptions of potential causality, then the concept of pharmacovigilance itself is void (Lyons-Weiler, 2021). However, we did make it clear in the Discussion that the ADR is an associative piece of data and does not allow for causal claims. Also, we conceded that the benefit might increase with time, thus improving the ratio. But we do not know this because we did not have the data at the time. With hindsight, this risk-benefit ratio did not improve (Bardosh et al., 2022; Emani et al., 2022; Fraiman et al., 2022; Franco-Paredes, 2022; Mörl et al., 2022)

Our paper was reviewed by three reviewers. They were allowed to mention their names, and as far as we can see, one of the reviewers was one whom we suggested. The other two were unknown to us, remained anonymous, and were obviously chosen by the editor. The one chosen by us made very helpful remarks, pointing out some mistakes and typos and suggesting improvements, all of which we incorporated. The other reviewer, unknown to us, praised the paper as a long-overdue analysis. He or she suggested even some stronger wording and some additional references, all of which we incorporated. The third reviewer was a bit critical but had nothing severe to criticize. He or she also appears to have not closely read our paper, as the person suggested things that we had actually performed, such as using a local database (we did use the local Dutch database). We incorporated all other suggestions. The editor accepted our paper.

Four days later, we received a note from the editorial office that an expression of concern had arrived. This concern was raised already the day following publication. It came from Prof. Eugène van Puijenbroek, the head of pharmacovigilance at Lareb. It raised the concern that we had illicitly used the ADR database of Lareb to draw causal inferences and stipulate that the reports are causally connected to the vaccine, which cannot be done because they are simple, unchecked reports only. He claimed in this letter that these reports come from patients and doctors only, while in another piece he had authored for

'Regulatory Science' the same year, he says that the database contains 58% of ADR reports entered by market authorization holders (<https://www.regulatoryscience.nl/editions/2021/12/prof.-dr.-eugene-van-puijenbroek-on-the-nature-of-signals>; accessed 29th June 2021). Either his allegation that only reports from patients and doctors went into the LAREB Covid-19-vaccine database is wrong, or there are different standards for vaccines compared to other medicinal products. The other point raised was that the data are not vetted, as we assumed their web entry to mean 'by medical specialists'. We were asked to answer this concern and did. The text of our rebuttal and that of our response to the retraction was only published by Retraction Watch (<https://retractionwatch.com/2021/07/02/journal-retracts-paper-claiming-two-deaths-from-covid-19-vaccination-for-every-three-prevented-cases/>, accessed 16<sup>th</sup> July 2021), not by the Journal.

In the meantime, the journal *Science* (<https://www.sciencemag.org/news/2021/07/scientists-quit-journal-board-protesting-grossly-irresponsible-study-claiming-covid-19>; accessed 11<sup>th</sup> July 2021) made public that six editors (of some 350) of the journal *Vaccines* had threatened to resign or had already resigned as a consequence of this journal's publishing our paper. These resignations had partially been announced on Twitter, where one of the editors said he had resigned, reacting to a Tweet asking how 'this piece of shit' got published. It can be safely assumed that it was this pressure that led to the Journal's retraction decision. Whether other pressures were exerted, for instance, by the Bill and Melinda Gates Foundation (BMGF), which funds the Journal through paying the publishing fees for their authors and receives access to the online submission system of the publisher (<https://www.mdpi.com/about/announcements/1415>, accessed 11<sup>th</sup> July 2021), will likely never be known and remains an informed speculation.

These pressures led to a retraction a couple of days after the paper was published. Until then, it had 100,000s of views and many downloads. After the retraction, we received quite a few letters of support from reputed scientists. One editor of the journal who wanted to remain anonymous expressed "dismay" about the journal's handling of this case, as did many others.

In our responses to the retraction, published by Retraction Watch, we pointed out that in the Publisher's Code of Ethics (<https://publicationethics.org/files/cope-retraction-guidelines-v2.pdf>, pages 3-4, accessed 11<sup>th</sup> July), which this journal (as most journals) subscribes to, there is a tight regulation for retractions. A retraction is warranted if:

- A paper makes fraudulent claims based on wrong or fabricated data – this does not apply.
- A paper makes false claims based on an analysis that is wrong – this does not apply; never was any criticism raised against the analysis.
- A paper is a piece of plagiarism, self- or other plagiarism – this does not apply either.

In all other cases, corrective action is warranted: an addendum, an amendment, an editorial remark, or perhaps even an amended version, which is easy to generate with online publishing. Thus, we conclude that the retraction was politically motivated and scientifically unwarranted and, hence, has to be seen as an instrument for sidelining critical voices. As a consequence, Poznan Medical University, where Harald Walach held half a teaching position, announced via Twitter on June 30<sup>th</sup>, 2021 that it had terminated the affiliation, which, in fact, meant that it had not extended a contract that was running out that day anyway, and was in the pipeline for an extension. As another consequence, the second University, Witten/Herdecke University, where Harald Walach held a visiting professorship teaching philosophical foundations of psychology to undergraduate students, also revoked the affiliation.

We resubmitted the paper. It went through another single-blind peer-review process with three independent reviewers and multiple cycles of editing and is now available again (Walach, Klement et al., 2021b). We smoothed the wording. The analysis still stands. So does the challenge.

### Case Study 2: Retracted: Walach, Weikl, Prentice, Diemer, Traindl, Kappes & Hockertz (2021)

The paper "*Experimental assessment of carbon dioxide content in inhaled air with or without face masks in healthy children: A randomized clinical trial*" was a study where we measured carbon dioxide content in inhaled air in 45 healthy volunteer children (aged 6 to 17) (Walach, et al., 2021). The study started with an initiative by parents to measure carbon dioxide levels under face masks worn by their children. After two school boards had rejected their requests, they approached us, and we set out to do our own study. Dr. Helmut Traindl, an oathbound, court-approved measurement specialist in indoor gas measurement, conducted the measurements using new equipment. The design was an intra-individually controlled experimental study with a baseline measurement, followed by two measurements under a surgical and an NP95/FFP2 respirator in counterbalanced order, followed by a post-baseline comparison. Measurements were conducted by a tube fixed to the upper lip of the child and ini-

tiated by a physician observing the child's breathing pattern, such that only inhaled air, exhaled air, or both were measured in separate steps. The measurements revealed high carbon dioxide content in inhaled air of more than 13,000 ppm after only three minutes, where 400 ppm is what we breathe in outside, and roughly 1,500 ppm inside, with 2,000 ppm being the safety level for children and pregnant women, as well as for workers under masks after 90 minutes.

The study was published as a short 600-word Letter by *JAMA Pediatrics* after three rounds of review by three experts in addition to the editor. Technical material had to go into a supplement, which had a word limit of 1,500 words, and we submit that some details that were contained there should have gone into the main body of the letter. The paper attracted quite some interest, as it was the only one of its kind at that time. Also, some critical comments were posted on *JAMA's* website. These comments were sent to Harald Walach as the corresponding author. They were answered in good time. After about three weeks, a note of concern was sent by *JAMA* editorial office, this time by another editor. A comparatively short time frame of three days was given for answering these concerns and questions ("by Friday business closing time"), and it was indicated that a review of the concerns and our answers would follow.

The next Monday, noon European time, i.e., morning business opening time on the East Coast, the answer came from the *JAMA* editorial office stating that the internal re-review had found that our answers were not sufficient, that a new review had reached them and as a consequence, the paper would be retracted. The paper was published on June 30<sup>th</sup>, 2021. The first concerns were commented on on the 5<sup>th</sup> of July 2021. On the 21<sup>st</sup> of July, we were notified of the concerns and asked to reply by July 23<sup>rd</sup>. Sometime in between, either initiated by the journal or unsolicited, a new review must have reached the journal. Although we had asked to see this additional review twice, it was not sent to us, and emails to the *JAMA* editorial office remained unanswered. Whether the editorial office went into a conclave over the weekend to ponder the review and our answers will remain the secret of *JAMA*.

Until October 2022, the paper had been viewed more than half a million times. The comments that were raised online after publication made it clear that most of them were misunderstandings or due to the fact that readers had either not accessed the supplementary material that contained technical details, or if they had accessed some of it, they had looked at wrong data-sheets and hence had made wrong conclusions about the suitability of the measurement devices used. For instance, some commen-

tators said we should have used capnography to measure carbon dioxide content instead of measuring carbon dioxide in the inhaled air directly. This is a little bit like saying if you want to measure the air pressure on top of a high-rise building, you should not use a barometer but measure the height of the building and, convert the height into the pressure difference and deduce it from the pressure you measure at the ground level. Possible, but not necessarily the most direct way. Other commentators had not understood the rationale of the measurements and might have overlooked a crucial piece of information, namely that the different breathing phases were manually checked by observing the breathing patterns of the child. In that vein, comments that were mainly due to misunderstandings, misreadings, and a lack of care when looking at the information provided amounted to a seemingly important argument against the validity of our measurements.

The speedy re-review process, the short deadline of only three days for answering complex questions – our answers were given in a commentary of some 6.000 words length, the alleged second review, which was never forwarded to us, the silence of the handling editor and the take-over of the process by someone higher up in the chain of command with *JAMA*, the lack of substance of the points raised, all this suggests that this was not a proper scientific process of finding fault and therefore retracting data, but of getting rid of something politically improper.

This was underlined by a 'fact-check' conducted by official public German TV (ARD) on its website, which denounced the study as unreliable. The fact check was conducted by a reporter who is known for reporting on horse-sporting events. Whether this qualification is sufficient to judge a scientific paper remains for readers to decide. It contained numerous errors, among others, the statement that the paper was not peer-reviewed. The German outlet *Deutsche Ärztezeitung* carried a political commentary using this fact-checking piece as a basis to denounce the findings, perpetuating the wrong assertions that the measurements were not valid. This type of character assassination is quite typical: A factually questionable fact-check is conducted by people with less-than-adequate qualifications who are being elevated to arbiters in highly complex questions. This verdict is then used by numerous campaigners or other media outlets that are more authoritative to speak a word of condemnation, which disqualifies the research and its authors.

The factual accusations were dispelled by the reviewers of the long version of the paper (which would have been available via pre-prints to readers of the short version as well), who seemed to have understood the rationale and the measurement of the study and hence

allowed its re-publication in the long version, which was published on May 28, 2022 (Walach, Traindl et al., 2022).

### Observation: Conflict of Interest and Money

We observe that some of the editors who demanded a retraction of our *Vaccines* paper are heavily conflicted. One of them is among the group that developed the vector vaccine in Oxford. One of them received a very big grant from the BMGF, and one of his postdocs has recently gone on to work for Moderna, the other developer of an mRNA vaccine against COVID-19. Another editor has also received BMGF grants. Another is high up in the hierarchy of the School of Public Health with the University of Maryland, the very institution that publishes a prominent COVID-19 dashboard and receives funding for it from GAVI. The others we have not checked out. We mentioned the sponsorship agreement between the publisher of the Journal, MDPI, and BMGF. Whether these connections lead to a direct chain of command of pressure or just to scissors in the head that cut out controversial thinking, we leave it to the readers to decide. But conflict of interest is an important element in seemingly rational choices (Angell, 2005, 2008; Brennan et al., 2006).

How conflict of interest has distorted our knowledge in medicine has been well documented. Making one's conflicts transparent is a first step. But it is also misleading because people think that conflicts laid bare are irrelevant. Much more relevant are the allegiances to world models and background assumptions that are rarely conscious. The philosopher Collingwood (1998, orig. 1940) termed these "absolute presuppositions." They shape our perception of the world. They inform our evaluations. And they cannot be easily changed or got rid of. The only chance we have is becoming conscious of them and becoming conscious of indoctrination. The road to becoming conscious of unwarranted preconceptions is open discourse.

This would actually be the task of scholarship and science. We observe that science has begun to be an acolyte of a new religion, the religion of scientism (Milgrom, 2021; van Fraassen, 2016; Williams & Robinson, 2016), and possibly also the project of trans-humanism (Bishop, 2010; Harari, 2017; Pinker, 2018; Sorgner, 2010; Wiley, 2022). The COVID-19 crisis brings this surreptitious equation of science with scientism and transhumanism to the fore. The new sacrament is the syringe that brings back freedom and a normal life. It is uncritically hailed, and whoever disturbs the ceremony, such as us, is a heretic who can be hunted down because he disturbs the Holy Mass. This is all in the name of 'saving lives'. But the neglect of safety factors shows, in our view, that the real agenda is not sav-

ing lives but introducing a new medical technology at all costs. Apart from that, had "saving lives" been the agenda, the pivotal trials would have to have used mortality as an outcome and not symptomatic COVID-19 disease, as they factually have.

This new technology brings a huge financial benefit to those who develop the vaccines, those who hold the patents, and the other stakeholders. The company that produced the mRNA vaccines in Germany, BioNTech, was technically broke before Bill Gates infused money into the company in October 2019. Two years later, it was worth several billion Euros. The mRNA technology is also a platform that can be used for deployment for other vaccines and medications. It had been studied in a government-sponsored research project some years earlier and was aborted because it was found that it violated two important principles of pharmacology: it was unclear and not actively controllable where the end product would be produced and in what dose (Stefan Hockertz, former director of Fraunhofer Lab responsible for this research, personal communication to HW).

We submit: had it not been for the pandemic, the uncritical media-support campaign, and the high fear level instilled into the public by that campaign (Bendau et al., 2021), this technology might not have seen the light of regulatory approval at all.

### Observation: Political Correctness, Media, and Pre-Emption of Lawsuits

Some commentators of our children-mask study were obviously just provoked because our study challenged the wisdom of mask-mandating for children. While it has now been mostly accepted that children are in no danger of contracting the disease and do not drive infections (Brandal et al., 2021; Dowell et al., 2022; O'Driscoll et al., 2021), the fear level among teachers and parents has resisted the revoking of mask mandates for a long time, despite the fact that our study has given a rationale to the widely reported symptoms of tiredness, fatigue, depression, and headaches, among others (Schwarz et al., 2021). Although the side effects of mask-wearing are much better documented (Kisielinski et al., 2021) than its benefits (Jefferson et al., 2020), although our measurements of 13,000 ppm carbon dioxide in inhaled air make clear why this is the case, there was widespread refusal to accept this fact. The reasons given were that children would be put in danger due to our study and that policies would have to be changed drastically. Indeed, even lawsuits might ensue if parents saw how rather baseless regulations violated a basic right, the right to breathe. Here, we observe that assent to a narrative, in that case, the mainstream narra-



tive about COVID-19, seems to be a more important driver than rational and fact-based information.

This is the result of a political correctness culture, whereby a certain interpretation of the world has been linked up with political factions – in the US, Democrats are more in line with the mainstream health narrative than Republicans; in Europe, Covid-19 critics being equated with right-wing ideology, “anti-vax” positions, and irrational and irresponsible people in general.

For instance, one commentator observed that some members of the team that conducted the mask study were members of MWGFD, “an anti-vaxxer campaign group.” This is a gross distortion. MWGFD is shorthand for, translated, “Doctors and Scientists for Health, Freedom and Democracy (Mediziner und Wissenschaftler für Gesundheit, Freiheit und Demokratie”, a charitable trust that formed in the wake of Covid-19 restrictions to critically assess these political measures. Indeed, HW, as well as some of his co-authors, is a member. Using this affiliation as an argument to retract a study would be tantamount to asking all pharmaceutical studies to be retracted because all these authors believe in the usefulness of pharmaceutical interventions.

This political correctness culture has to do, we suppose, with the world becoming more complex. This goes together with the fact that those who used to pre-sort this complex situation, namely specialists in the media, have become fewer, and more of them are working within precarious contracts. This leads to a lack of professionalism, to short-lived and little-reflected papers to please what is perceived as the majority view, both in the editorial offices and in the public. Strong section editors, who are independent because they have a lifetime contract, are a rare commodity these days. One of us (HW) has conducted interviews with various experts. Media experts all lament the fact that the funding of mainstream print media has been reduced by the diversion of advertising funds to internet media, and the classical print media are dependent on political funding. Hence, they crawl closer to the political caste, sensing what is politically feasible and correct. Thereby, they corrupt what has been the most important task of the press: to critically accompany political discussions. Media have become campaigning instruments for majority views instead of instruments of critical discussion and correctives for unhealthy monopoly building and the industry or NGO-funded think tanks.

It should not be forgotten: Had mandates been challenged by science on a broader front, lawsuits might have followed that could have hampered both the financial viability of some actors and the political credibility of decision-makers, parties, and even whole systems. Thus, political systems were highly motivated to prevent this from

happening. Does this mean that there was direct collusion to attack dissenting opinions by retractions? Not necessarily. Some self-organization processes along the lines of the ruling paradigm, the majority view, and the mainstream narrative might be sufficient to understand what happened and how it came to be (Desmet, 2022). For instance, the German Max-Planck Institutes are state-funded. It is not surprising that some of the weakest research, which supported governmental decisions but was demonstrably wrong, came from there (Dehning, Zierenberg et al., 2020; Kuhbandner et al., 2022).

What we can, therefore, conclude is that the pandemic has provided a vivid illustration of the ways in which scientific discourse has broken down. Unwanted and unpopular ideas and findings cannot be accepted as such and countered by counterargument, counter-fact, and counter-analysis, it seems, but they have to be ushered out of the room lest they disturb the party. What could be remedial? We suggest that officials in universities, in the public sphere, in the media should stand up to and face their fear of coordinated attacks via social or other media and cultivate a conscious culture of discourse, actively seeking and supporting dissenting opinions. It is only through actively and willingly engaging with such dissent that a stable and socially affirmative consensus can be reached.

We think that the consequences of conflict of interests should be researched much more broadly, perhaps through public programs to sensitize people to the devastating effects of such conflicts on the culture of discourse. Universities should revisit their rationale for being. This is not to produce obedient working ants for the production process but people who are able to think critically and also to be able and willing to oppose societal trends that are dangerous for freedom, human rights and historically achieved benefits, such as freedom of speech, freedom to decide on one’s life trajectory, to choose medical treatment or forego it, etc. In that vein, universities have an obligation to not only harbor thinkers who dissent but also to actively support them instead of firing them or making their lives difficult. In Germany, we have observed that it is mainly the younger generation, students, and often young academics that are vigorously opposed to open debates in the name of political correctness. A cancel culture ensued, where speakers or discussants who would not support the mainstream view were either not invited or disinvited after social media shit-storms followed an announcement of a debate or a lecture series. It is the task of the senior management in universities and elsewhere to not bow to the pressure of public opinion. After all, it was the pressure of streets that led to some very dire political consequences in the

last century, and we should prevent this from happening again. The Covid-19 crisis showed how close we are to similar circumstances all around the world. We may be wrong, but without an active discourse, we will never know. Short-circuiting discourse, canceling unwanted opinions, and drowning voices of opposition in a roar of political correctness are the high road to fascism.

## REFERENCES

- Abbasi, K. (2020). Covid-19: politicisation, "corruption," and suppression of science. *The BMJ*, 371, Article m4425. <https://doi.org/10.1136/bmj.m4425>
- Ahn, A. C., Tewari, M., Poon, C.-S., & Phillips, R. S. (2006). The limits of reductionism in medicine: Could systems biology offer an alternative? *PLoS Medicine*, 3(6), Article e208. <https://doi.org/10.1371/journal.pmed.0030208>
- Alatawi, Y. M., & Hansen, R. A. (2017). Empirical estimation of under-reporting in the U.S. Food and Drug Administration Adverse Event Reporting System (FAERS). *Expert Opinion on Drug Safety*, 16(7), 761-767. <https://doi.org/10.1080/14740338.2017.1323867>
- Angell, M. (2005). *The truth about the drug companies: How they deceive us and what to do about it*. Random House.
- Angell, M. (2008). Industry-sponsored clinical research: A broken system. *JAMA*, 300(9), 1069-1071. <https://doi.org/10.1001/jama.300.9.1069>
- an der Heiden, M., & Buchholz, U. (2020). Modellierung von Beispielszenarien der SARS-CoV-2-Epidemie 2020 in Deutschland.
- Arvay, C. G. (2020). Genetische Impfstoffe gegen COVID-19: Hoffnung oder Risiko. *Schweizerische Ärztezeitung*, 101(27-28), 862-864. <https://doi.org/10.4414/saez.2020.18982>
- Bardosh, K., de Figueiredo, A., Gur-Arie, R., Jamrozik, E., Doidge, J., et al., (2022). The unintended consequences of COVID-19 vaccine policy: Why mandates, passports and restrictions may cause more harm than good. *BMJ Global Health*, 7(5), Article e008684. <https://doi.org/10.1136/bmjgh-2022-008684>
- Bendau, A., Petzold, M. B., Pyrkosch, L., Mascarell Maricic, L., Betzler, F., et al., (2021). Associations between COVID-19 related media consumption and symptoms of anxiety, depression and COVID-19 related fear in the general population in Germany. *European Archives of Psychiatry and Clinical Neuroscience*, 271(2), 283-291. <https://doi.org/10.1007/s00406-020-01171-6>
- Bishop, J. P. (2010). Transhumanism, metaphysics, and the posthuman god. *Journal of Medicine and Philosophy*, 35, 700-720. <https://doi.org/10.1093/jmp/jhq047>
- Borger, P., Malhotra, R. K., Yeadon, M., Craig, C., McKernan, K., et al., (2020). External peer review of the RTPCR test to detect SARS-CoV-2 reveals 10 major scientific flaws at the molecular and methodological level: Consequences for false positive results. *Zenodo*, Article 4298004. <https://doi.org/10.5281/zenodo.4298004>
- Brandal, L. T., Ofitserova, T. S., Meijerink, H., Rykkvin, R., Lund, et al., (2021). Minimal transmission of SARS-CoV-2 from paediatric COVID-19 cases in primary schools, Norway, August to November 2020. *Eurosurveillance*, 26(1), Article 2002011. <https://doi.org/10.2807/1560-7917.ES.2020.26.1.2002011>
- Brennan, T. A., Rothman, D. J., Blank, L., Blumenthal, D., Chimonas, S. C., et al., (2006). Health industry practices that create conflicts of interest: A policy proposal for academic medical centers. *JAMA*, 295(4), 429-433. <https://doi.org/10.1001/jama.295.4.429>
- Collingwood, R. G. (1998, orig. 1940). *An essay on metaphysics* (revised ed.). Clarendon Press.
- Collins, H., & Pinch, T. (2005). *Dr. Golem: How to think about medicine*. University of Chicago Press. <https://doi.org/10.7208/chicago/9780226113692.001.0001>
- Corman, V. M., Landt, O., Kaiser, M., Molenkamp, R., Meijer, A., et al., (2020). Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR. *Eurosurveillance*, 25(3), Article 2000045. <https://doi.org/10.2807/1560-7917.ES.2020.25.3.2000045>
- Dagan, N., Barda, N., Kepten, E., Miron, O., Perchik, S., et al., (2021). BNT162b2 mRNA Covid-19 vaccine in a nationwide mass vaccination setting. *New England Journal of Medicine*, 384, 1412-1423. <https://doi.org/10.1056/NEJMoa2101765>
- Dehning, J., Spitzner, F. P., Linden, M., Mohr, S. B., Neto, J. P., et al., (2020). Model-based and model-free characterization of epidemic outbreaks - Technical notes on Dehning et al. *Science*, 2020. <https://doi.org/10.1101/2020.09.16.20187484>
- Dehning, J., Zierenberg, J., Spitzner, F. P., Wibral, M., Neto, J. P., et al., (2020). Inferring change points in the spread of COVID-19 reveals the effectiveness of interventions. *Science*, 369(6500), Article eabb9789. <https://doi.org/10.1126/science.abb9789>
- Desmet, M. (2022). *The psychology of totalitarianism*. Chelso Green.
- Dowell, A. C., Butler, M. S., Jinks, E., Tut, G., Lancaster, T., et al., (2022). Children develop robust and sustained cross-reactive spike-specific immune responses to SARS-CoV-2 infection. *Nature Immunology*, 23(1), 40-49. <https://doi.org/10.1038/s41590-021-01089-8>
- El Dib, R. P., Atallah, A. N., & Andriolo, R. B. (2007). Mapping the Cochrane evidence for decision making in health care. *Journal of Evaluation in Clinical Prac-*

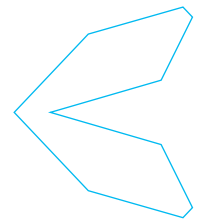


- tice, 13, 689-692. <https://doi.org/10.1111/j.1365-2753.2007.00886.x>
- Elisha, E., Guetzkow, J., Shir-Raz, Y., & Ronel, N. (2022). Retraction of scientific papers: The case of vaccine research. *Critical Public Health*, 32(4), 533-542. <https://doi.org/10.1080/09581596.2021.1878109>
- Emani, V. R., Pallipuram, V. K., Goswami, K. K., Maddula, K. R., Reddy, R., et al., (2022). Increasing SARS-CoV2 cases, hospitalizations, and deaths among the vaccinated elderly populations during the Omicron (B.1.1.529) variant surge in UK. *medRxiv*, Article 2022.2006.2028.22276926. <https://doi.org/10.1101/2022.06.28.22276926>
- Everts, J. (2020). The dashboard pandemic. *Dialogues in Human Geography*, 10(2), 260-264. <https://doi.org/10.1177/2043820620935355>
- Ferguson, N., Laydon, D., Nedjati Gilani, G., Imai, N., Ainslie, K., et al., (2020). Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. *M. C. f. G. I. D. A. R. 9*. <https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/news--wuhan-coronavirus/>
- Fleck, L. (1979). *Genesis and development of a scientific fact*. Ed. by T.J. Trenn and R.K. Merton. University of Chicago Press.
- Fraiman, J., Erviti, J., Jones, M., Greenland, S., Whelan, P., Kaplan, R. M., & Doshi, P. (2022). Serious adverse events of special interest following mRNA COVID-19 vaccination in randomized trials in adults. *Vaccine*, 40(40), 5798-5805. <https://doi.org/10.1016/j.vaccine.2022.08.036>
- Franco-Paredes, C. (2022). Transmissibility of SARS-CoV-2 among fully vaccinated individuals. *The Lancet Infectious Diseases*, 22(1), 16. [https://doi.org/10.1016/S1473-3099\(21\)00768-4](https://doi.org/10.1016/S1473-3099(21)00768-4)
- Gabbay, J., & le May, A. (2004). Evidence based guidelines or collectively constructed "mindlines"? Ethnographic study of knowledge management in primary care. *British Medical Journal*, 329, 1013-1017. <https://doi.org/10.1136/bmj.329.7473.1013>
- Gill, J., Haslam, A., Crain, T., Herrera-Perez, D., & Prasad, V. (2020). Comparison of industry payments in 2017 with annual salary in a cohort of academic oncologists. *JAMA Internal Medicine*, 180(5), 797-799. <https://doi.org/10.1001/jamainternmed.2020.0090>
- Gorbalenya, A. E., Baker, S. C., Baric, R. S., de Groot, R. J., Drosten, C., et al., (2020). The species Severe acute respiratory syndrome-related coronavirus: Classifying 2019-nCoV and naming it SARS-CoV-2. *Nature Microbiology*, 5(4), 536-544. <https://doi.org/10.1038/s41564-020-0695-z>
- Gøtzsche, P. C. (2013). *Deadly medicines and organised crime: How big pharma has corrupted health care*. Radcliffe.
- Gøtzsche, P. C. (2015). *Deadly psychiatry and organised denial*. People's Press.
- Gøtzsche, P. C. (2019). *Death of a whistleblower and Cochrane's moral collapse*. People's Press.
- Greenhalgh, T., & Worrall, J. G. (1997). From EBM to CSM: The evolution of context-sensitive medicine. *Journal of Evaluation in Clinical Practice*, 3(2), 105-108. <https://doi.org/10.1046/j.1365-2753.1997.00096.x>
- Harari, Y. N. (2017). *Homo Deus: A brief history of tomorrow*. Vintage. <https://doi.org/10.17104/9783406704024>
- Hazell, L., & Shakri, S. A. W. (2006). Under-reporting of adverse drug reactions: A systematic review. *Drug Safety*, 29(5), 385-396. <https://doi.org/10.2165/00002018-200629050-00003>
- Horton, R. (2015). Offline: What is medicine's 5 sigma? *The Lancet*, 385(9976), 1380. [https://doi.org/10.1016/S0140-6736\(15\)60696-1](https://doi.org/10.1016/S0140-6736(15)60696-1)
- Howick, J., Koletsi, D., Ioannidis, J. P. A., Madigan, C., Pandis, N., et al., (2022). Most healthcare interventions tested in Cochrane Reviews not effective according to high quality evidence: A systematic review and meta-analysis. *Journal of Clinical Epidemiology*, 148, 160-169. <https://doi.org/10.1016/j.jclinepi.2022.04.017>
- Howick, J., Koletsi, D., Pandis, N., Fleming, P. S., Loeff, M., et al., (2020). The quality of evidence for medical interventions does not improve or worsen: A meta-epidemiological study of Cochrane reviews. *Journal of Clinical Epidemiology*, 126, 154-159. <https://doi.org/10.1016/j.jclinepi.2020.08.005>
- Hua, J., & Shaw, R. (2020). Corona virus (COVID-19) "infodemic" and emerging issues through a data lens: The case of China. *International Journal of Environmental Research and Public Health*, 17(7), Article 2309. <https://www.mdpi.com/1660-4601/17/7/2309>
- Ioannidis, J. P. A. (2005). Why most published research findings are false. *PLoS Medicine*, 2(8), Article e124. <https://doi.org/10.1371/journal.pmed.0020124>
- Ioannidis, J. P. A. (2018). Cochrane crisis: Secrecy, intolerance, and evidence-based values. *European Journal of Clinical Investigation*, 49(3), Article e13058. <https://doi.org/10.1111/eci.13058>
- Jefferson, T., Del Mar, C., Dooley, E., Ferroni, E., Al-Ansari, L. A., et al., (2020). Physical interventions to interrupt or reduce the spread of respiratory viruses. *Cochrane Database of Systematic Reviews*, CD006207. <https://doi.org/10.1002/14651858.CD006207.pub5>
- Keil, U., Schönhöfer, P., & Spelsberg, A. (2011). The invention of the swine-flu pandemic. *European Journal of Epidemiology*, 26(3), 187-190. <https://doi.org/10.1007/>

- s10654-011-9573-6
- Kisielinski, K., Giboni, P., Prescher, A., Klosterhalfen, B., Graessel, D., et al., (2021). Is a mask that covers the mouth and nose free from undesirable side effects in everyday use and free of potential hazards? *International Journal of Environmental Research and Public Health*, 18(8), Article 4344. <https://doi.org/10.3390/ijerph18084344>
- Klement, R. J. (2020a). The SARS-CoV-2 crisis: A crisis of reductionism? *Public Health*, 185, 70-71. <https://doi.org/10.1016/j.puhe.2020.06.019>
- Klement, R. J. (2020b). The SARS-CoV-2 crisis: Has medicine finally entered a reductionist era? *Complementary Medicine Research*, 27(4), 207-208. <https://doi.org/10.1159/000510453>
- Klement, R. J. (2020c). Systems thinking about SARS-CoV-2. *Frontiers in Public Health*, 8, Article 585229. <https://doi.org/10.3389/fpubh.2020.585229>
- Klement, R. J., & Bandyopadhyay, P. S. (2019). Emergence and evidence: A close look at Bunge's philosophy of medicine. *Philosophies*, 4(3), Article 50. <https://doi.org/10.3390/philosophies4030050>
- Klement, R. J., & Bandyopadhyay, P. S. (2020). The epistemology of a positive SARS-CoV-2 test. *Acta Biotheoretica*, 69, 359-375. <https://doi.org/10.1007/s10441-020-09393-w>
- Klement, R. J., & Walach, H. (2023). SEIR models in the light of critical realism - A critique of exaggerated claims about the effectiveness of Covid 19 vaccinations. *Futures*, 148, Article 103119. <https://doi.org/10.1016/j.futures.2023.103119>
- Kowarz, E., Krutzke, L., Reis, J., Bracharz, S., Kochanek, S., & Marschalek, R. (2021). "Vaccine-induced Covid-19 mimicry" syndrome: Splice reactions within the SARS-CoV-2 Spike open reading frame result in Spike protein variants that may cause thromboembolic events in patients immunized with vector-based vaccines. *Research Square*. <https://doi.org/10.21203/rs.3.rs-558954/v1>
- Krüger, U. (2013). *Meinungsmacht: Der Einfluss von Eliten auf Leitmedien und Alpha-Journalisten. Eine kritische Netzwerkanalyse*. von Halem.
- Krutzke, L., Roesler, R., Wiese, S., & Kochanek, S. (2021). Process-related impurities in the ChAdOx1 nCov-19 vaccine. *Nature Portfolio*. <https://doi.org/10.21203/rs.3.rs-477964/v1>
- Kuhbandner, C., Homburg, S., Walach, H., & Hockertz, S. (2020a). Comment on Dehning et al (Science, 15 May 2020, eabb9789: Inferring change points in the spread of COVID-19 reveals the effectiveness of interventions). *Advance Social Sciences and Humanities Preprint, Preprint*. <https://doi.org/10.31124/advance.12362645.v1>
- Kuhbandner, C., Homburg, S., Walach, H., & Hockertz, S. (2020b). Was Germany's corona lockdown necessary? *Advance - Sage Preprint*. <https://doi.org/10.31124/advance.12362645.v3>
- Kuhbandner, C., Homburg, S., Walach, H., & Hockertz, S. (2022). Was Germany's lockdown in spring 2020 necessary? How bad data quality can turn a simulation into a dissimulation that shapes the future. *Futures*, 135, Article 102879. <https://doi.org/10.1016/j.futures.2021.102879>
- Loughlin, M., Lewith, G., & Falkenberg, T. (2013). Science, practice and mythology: A definition and examination of the implications of scientism in medicine. *Health Care Analysis*, 21, 130-145. <https://doi.org/10.1007/s10728-012-0211-6>
- Lyons-Weiler, J. (2021). If vaccine adverse events tracking systems do not support causal inference, then "pharmacovigilance" does not exist. *Science, Public Health Policy, and the Law*, 3, 81-86. [https://cf5e727d-d02d-4d71-89ff-9fe2d3ad957f.filesusr.com/ugd/ad-f864\\_4588b37931024c5d98e35a84acf8069a.pdf](https://cf5e727d-d02d-4d71-89ff-9fe2d3ad957f.filesusr.com/ugd/ad-f864_4588b37931024c5d98e35a84acf8069a.pdf)
- Makary, M. A., & Daniel, M. (2016). Medical error—the third leading cause of death in the US. *The BMJ*, 353, Article i2139. <https://doi.org/10.1136/bmj.i2139>
- Meyer-Abich, K. M. (2010). *Was es bedeutet, gesund zu sein. Philosophie der Medizin*. Hanser.
- Miles, A., & Asbridge, J. (2014). Clarifying the concepts, epistemology and lexicon of person-centeredness: An essential pre-requisite for the effective operationalization of PCH within modern healthcare systems (Editorial). *European Journal of Person Centered Healthcare*, 2(1), 1-15. <https://doi.org/10.5750/ejpch.v2i1.857>
- Milgrom, L. (2021). Against scientism: Corrupted science and the fight for medicine's soul. *Complementary Medicine Research*, 28(1), 56-63.
- Moore, T. J., & Bennett, C. L. (2012). Underreporting of hemorrhagic and thrombotic complications of pharmaceuticals to the U.S. Food and Drug Administration: Empirical findings for Warfarin, Clopidogrel, Ticlopidine, and Thalidomide from the Southern Network on Adverse Reactions (SONAR). *Seminars in Thrombosis Hemostasis*, 38(08), 905-907.
- Mörl, F., Günther, M., & Rockenfeller, R. (2022). Is the harm-to-benefit ratio a key criterion in vaccine approval? [Opinion]. *Frontiers in Medicine*, 9, Article 879120. <https://doi.org/10.3389/fmed.2022.879120>
- Nordström, P., Ballin, M., & Nordström, A. (2021). Risk of infection, hospitalisation, and death up to 9 months after a second dose of COVID-19 vaccine: A retrospective, total population cohort study in Sweden. *Lan-*

- cet*, 399(10327), 814-823. [https://doi.org/10.1016/S0140-6736\(22\)00089-7](https://doi.org/10.1016/S0140-6736(22)00089-7)
- O'Driscoll, M., Ribeiro Dos Santos, G., Wang, L., Cummings, D. A. T., Azman, A. S., et al., (2021). Age-specific mortality and immunity patterns of SARS-CoV-2. *Nature*, 590(7844), 140-145. <https://doi.org/10.1038/s41586-020-2918-0>
- Olliaro, P., Torreele, E., & Vaillant, M. (2021). COVID-19 vaccine efficacy and effectiveness - The elephant (not) in the room. *The Lancet Microbe*, 2(7), e279-e280. [https://doi.org/10.1016/S2666-5247\(21\)00069-0](https://doi.org/10.1016/S2666-5247(21)00069-0)
- Pinker, S. (2018). *Enlightenment now: The case for reason, science, humanism, and progress*. Penguin.
- Polack, F. P., Thomas, S. J., Kitchin, N., Absalon, J., Gurtman, A., et al., (2020). Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine. *New England Journal of Medicine*, 383(27), 2603-2615. <https://doi.org/10.1056/NEJMoa2034577>
- Ren, L. L., Wang, Y. M., Wu, Z. Q., Xiang, Z. C., Guo, L., et al., (2020). Identification of a novel coronavirus causing severe pneumonia in human: A descriptive study. *Chinese Medical Journal (Engl)*, 133(9), 1015-1024. <https://doi.org/10.1097/cm9.0000000000000722>
- Ridings, J. E. (2013). The thalidomide disaster, lessons from the past. In B. P. Barrow (Ed.), *Teratogenicity testing* (vol. 947, pp. 575-586). Humana Press. [https://doi.org/10.1007/978-1-62703-131-8\\_36](https://doi.org/10.1007/978-1-62703-131-8_36)
- Rose, J. (2021). A report on the U.S. vaccine adverse events reporting system (VAERS) on the Covid-19 messenger ribonucleic acid (mRNA) biologicals. *Science, Public Health Policy, and the Law*, 2, 59-80. [https://www.publichealthpolicyjournal.com/\\_files/ugd/adf864\\_a0a813acbfdc4534a8cb50cf85193d49.pdf](https://www.publichealthpolicyjournal.com/_files/ugd/adf864_a0a813acbfdc4534a8cb50cf85193d49.pdf)
- Sahin, U., Karikó, K., & Türeci, Ö. (2014). mRNA-based therapeutics — Developing a new class of drugs. *Nature Reviews Drug Discovery*, 13(10), 759-780. <https://doi.org/10.1038/nrd4278>
- Schwarz, S., Jenetzky, E., Krafft, H., Maurer, T., & Martin, D. (2021). Coronakinderstudien "Co-Ki": Erste Ergebnisse eines deutschlandweiten Registers zur Mund-Nasen-Bedeckung (Maske) bei Kindern [Corona children studies "Co-Ki": First results of a Germany-wide registry on mouth and nose covering (mask) in children]. *Monatsschrift Kinderheilkunde*, 169, 353-365. <https://doi.org/10.1007/s00112-021-01133-9>
- Seneff, S., & Nigh, G. (2021). Worse than the disease? Reviewing some possible unintended consequences of the mRNA vaccines against COVID-19. *International Journal of Vaccine Theory, Practice, and Research*, 2(1), 38-79. <https://doi.org/10.56098/ijvtpr.v2i1.23>
- Seneff, S., Nigh, G., Kyriakopoulos, A., & McCullough, P. (2022). Innate immune suppression by SARS-CoV-2 mRNA vaccinations: The role of G-quadruplexes, exosomes and microRNAs. *Food and Chemical Toxicology*, 164, Article 113008. <https://doi.org/10.1016/j.fct.2022.113008>
- Shir-Raz, Y., Elisha, E., Martin, B., Ronel, N., & Guetzkow, J. (2022). Censorship and suppression of Covid-19 heterodoxy: Tactics and counter-tactics. *Minerva*, 1-27. <https://doi.org/10.1007/s11024-022-09479-4>
- Sorgner, S. L. (2010). Beyond humanism: Reflections on trans- and posthumanism. *Journal of Evolution and Technology*, 21(2), 1-9. <http://jetpress.org/v21/sorgner.htm>
- Stachowske, R. (2014). Kindesmisshandlungen vor und nach der Schwangerschaft: "Contergan-Katastrophe Nr. 2". *Trauma - Zeitschrift für Psychotraumatologie und ihre Anwendungen*, 12(3), 4-11.
- Sturmberg, J. P., & Martin, C. M. (2021). How to cope with uncertainty? Start by looking for patterns and emergent knowledge. *Journal of Evaluation in Clinical Practice, online first*. <https://doi.org/10.1111/jep.13596>
- Thomas, S. J., Moreira, E. D., Kitchin, N., Absalon, J., Gurtman, A., et al., (2021). Six month safety and efficacy of the BNT162b2 mRNA COVID-19 vaccine. *medRxiv*, Article 2021.2007.2028.21261159. <https://doi.org/10.1101/2021.07.28.21261159>
- Tseng, C.-T., Sbrana, E., Iwata-Yoshikawa, N., Newman, P. C., Garron, T., et al., (2012). Immunization with SARS coronavirus vaccines leads to pulmonary immunopathology on challenge with the SARS virus. *PLoS One*, 7(4), Article e35421. <https://doi.org/10.1371/journal.pone.0035421>
- Uexküll, T. v. (1995). Biosemiotic research and not further molecular analysis is necessary to describe pathways between cells, personalities, and social systems. *Advances*, 11, 24-27.
- Uexküll, T. v., & Wesiack, W. (1988). *Theorie der Humanmedizin. Grundlagen ärztlichen Denkens und Handelns* [Theory of medicine. Foundations of medical thinking and action]. Urban & Schwarzenberg.
- van Fraassen, B. (2016). Naturalism in epistemology. In R. N. Williams & D. N. Robinson (Eds.), *Scientism: The new orthodoxy* (pp. 64-95). Bloomsbury.
- Walach, H., & Hockertz, S. (2020a). A reply to Dr. Pan's and Dr. Wu's response: "Wuhan COVID-19 data – An example to show the importance of public health interventions to fight against the pandemic". *Toxicology*, 441, Article 152524. <https://doi.org/10.1016/j.tox.2020.152524>
- Walach, H., & Hockertz, S. (2020b). Wuhan Covid19 data – More questions than answers. *Toxicology*, 440, Article 152486. <https://doi.org/10.1016/j.tox.2020.152486>
- Walach, H., Klement, R. J., & Aukema, W. (2021a). Retract-

- ed: The safety of COVID-19 vaccinations—We should rethink the policy. *Vaccines*, 9(7), Article 693. <https://doi.org/10.3390/vaccines9070693>
- Walach, H., Klement, R. J., & Aukema, W. (2021b). The safety of COVID-19 vaccinations — Should we rethink the policy? *Science, Public Health Policy, and the Law*, 3, 87-99. <https://doi.org/10.3390/vaccines9070693>
- Walach, H., Klement, R. J., & Aukema, W. (2022). The risk-benefit ratio of Covid-19 vaccines: Publication policy by retraction does nothing to improve it. *Clinical and Translational Discovery*, 2(1), Article e35. <https://doi.org/10.1002/ctd2.35>
- Walach, H., Ofner, M., Ruof, V., Herbig, M., & Klement, R. J. (2022). Why do people consent to receiving SARS-CoV2 vaccinations? A representative survey in Germany. *BMJ Open*, 12(8), Article e060555. <https://doi.org/10.1136/bmjopen-2021-060555>
- Walach, H., Ruof, V., & Hellweg, R. (2021). Opinion of German immunologists' on SARS-CoV2: Results of an online survey. *Cureus*, 13(11), Article e19393. <https://doi.org/10.7759/cureus.19393>
- Walach, H., Traindl, H., Prentice, J., Weikl, R., Diemer, A., Kappes, A., & Hockertz, S. (2022). Carbon dioxide rises beyond acceptable safety levels in children under nose and mouth covering: Results of an experimental measurement study in healthy children. *Environmental Research*, 212, Article 113564. <https://doi.org/10.1016/j.envres.2022.113564>
- Walach, H., Weikl, R., Prentice, J., Diemer, A., Traindl, H., Kappes, A., & Hockertz, S. (2021). Retracted: Experimental assessment of carbon dioxide content in inhaled air with or without face masks in healthy children: A randomized clinical trial. *JAMA Pediatrics*. <https://doi.org/10.1001/jamapediatrics.2021.2659>
- Watson, O. J., Barnsley, G., Toor, J., Hogan, A. B., Winskill, P., & Ghani, A. C. (2022). Global impact of the first year of COVID-19 vaccination: A mathematical modelling study. *Lancet Infectious Diseases*, 22(9), 1293-1302. [https://doi.org/10.1016/S1473-3099\(22\)00320-6](https://doi.org/10.1016/S1473-3099(22)00320-6)
- Wieland, W. (1975). *Diagnose. Überlegungen zur Medizintheorie.* de Gruyter. <https://doi.org/10.1515/9783110845945>
- Wiley, N. M. (2022). Critique of the necropolitical economy of the Internet of Things: Brains, biohacking, and social apartheid. *International Journal of Computer Science and Engineering Survey*, 13(3), 1-12. <https://doi.org/10.5121/ijcses.2022.13301>
- Williams, R. N., & Robinson, D. N. (Eds.). (2016). *Scientism: The new orthodoxy.* Bloomsbury.
- Wolf, N. (2022). *The body of others: The new authoritarians, COVID-19 and the war against the human.* All Seasons Press.
- World Health Organization. (2020). WHO Director-General's opening remarks at the media briefing on COVID-19 11 March 2020.
- Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., et al., (2020). A novel coronavirus from patients with pneumonia in China, 2019. *New England Journal of Medicine*, 382(8), 727-733. <https://doi.org/10.1056/NEJMoa2001017>



ESSAY

# Failings of Nessie Debunkers and of Debunkers in General

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## HIGHLIGHTS

Debunkers of “Nessie” often rely on logical fallacies that only address the weakest evidence versus the strongest evidence that requires more careful study.

## ABSTRACT

That Loch Ness Monsters, “Nessies”, might exist has been argued by many people on the basis of films, sonar contacts, photos, and eyewitness accounts. At the same time, some observers have insisted that these are not real creatures, nothing but misperceptions of natural phenomena or known animals. Their arguments typically address the weakest evidence (eyewitness accounts) rather than the strongest objective evidence of sonar and film. Such evasion or avoidance constitutes a strategy of misdirection, as does the insistence that, since Nessies are not recognized by “science,” therefore taking their possible existence seriously amounts to doing pseudo-science. Debunkers are arguably irrational and go beyond the evidence in declaring that Nessies are definitely non-existent. Although Nessie fans do believe that they exist, most will admit that final proof requires a specimen or detailed close-up of unequivocally valid photography and insist only that enough evidence exists to warrant further searches: that is not pseudo-science.

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## KEYWORDS

Cryptozoology, field research, Loch Ness Monsters, Nessies, strategies of debunking.

## INTRODUCTION

There is considerable, widespread public interest in many topics that are pooh-pooed and dismissed by the established institutions of academic science and medicine. The number of such topics is vast, but many of the best-known ones are subsumed in the three major groupings of *parapsychology* (study of psychic phenomena), *ufology* (study of unidentified aerial phenomena, UFOs), and *cryptozoology* (possible existence of animals officially regarded as extinct or mythical or not known in the

claimed particular place or time).

Among these interests officially regarded as intellectually beyond the pale, there may well be no topic more widely recognized around the world than the Loch Ness Monster, or ‘Nessie’. All media and advertisers seem to know that they can attract attention by mentioning Nessie. Newspapers frequently recycle stories about the Loch Ness Monster. Television documentaries about it continue to be made, as well as fictional movies. Starting in late July 2022, dozens of newspapers and online media used such ledes as “Scientists say Loch Ness Monster



plausible<sup>3</sup> merely because of the discovery in *Morocco* of the fossil of a *small* plesiosaur in a freshwater environment (Bunker et al., 2022). One observer has been moved to beg the media to stop using Nessie as clickbait<sup>4</sup>.

Opinions are divided over the possible reality of as-yet-unidentified large creatures in Loch Ness, ranging from asserted positive certainty through a degree of neutrality to indignantly expressed certainty that Nessies are anything but real animals. A popular view among those of the last opinion is that Nessies are a creation of the Scottish tourist industry. Among those who believe Nessies to be real, there is no agreement as to what sort of animal they might be, although reptilian seems more favored than fish, mammal, amphibian, or invertebrate, all of which have been suggested at one time or another.

Since debunking has its origin in a determined presumption that some given unorthodox claim is unbelievably unlikely to be valid, the debunkers' polemics then focus on demonstrating this improbability. Typically rehearsed are the imperfections of human perception and recall, including the psychological bias that causes us to "see" what we expect to and the unhappy fact that some people may, for various reasons, behave dishonestly, to the extent of perpetrating hoaxes; and, with Nessies, much is made of the innumerable things and happenings around Loch Ness that could easily be mistaken for a sighting of a Monster<sup>5</sup>.

Debunkers then naturally conclude that all the possibilities they have suggested are more probable than the highly improbable existence of Nessies. High improbability is then equated with certainty<sup>6</sup>: case closed! But the case for Nessies is not that their existence is probable; it is that they exist *even though this naturally seems highly improbable*. All the reasons for the improbability are simply irrelevant.

## DISCLOSURES

We authors have long been of the opinion that Nessies are real animals, and fascinated by the mystery of what type of species they may be. Accordingly, we disclose conflicts of interest as we debunk the arguments of the Nessie debunkers:

**Henry Bauer:** Around 1961 or 1962, I happened to come across Tim Dinsdale's *Loch Ness Monster*. Intrigued by the published clips from his film, I read whatever else I could find on the subject. I became a member of the Loch Ness Investigation, receiving their Newsletters while living in Australia. During a sabbatical year at the University of Southampton, I visited Loch Ness and there met Dinsdale, who subsequently became a close friend. I organized lecture tours for him in 1975 in Kentucky (USA) and

in 1979 in Virginia (USA). Tim gave me a 16 mm. copy of his film, which I had digitized frame by frame in the early 1980s by a commercial company, and again a few years later courtesy of a professor of computer science at my university (Virginia Tech).

I visited Loch Ness again in 1983; spent a couple of months there in 1985, and for nearly 20 years, from 1987, my wife and I spent two to three weeks every summer at or near Loch Ness, usually in a chalet or cottage overlooking Urquhart Bay. At various times I met and talked with a number of individuals who have featured in the Loch Ness saga: Alastair Boyd, Winifred (Freddie) Cary, Gary Campbell, Steuart Campbell, Tony Harmsworth, Steve Feltham, Rip Hepple, Dick Raynor, Robert Rines, Adrian Shine, and Nick Witchell.

I became thoroughly familiar with common phenomena easily misperceived as Nessies<sup>5</sup>: wind and wave effects; wakes made by duck families; I saw the head of a seal in the Bay in 1985 and filmed in 1983 a wake remainder that looked just like something dark breaking the surface several times, causing white splashes.

We became friends with Dick and Sybil Mackintosh and heard from Dick, a lifelong fisherman on Loch Ness, of his encounter with "a huge gray mass" that once broke the surface not far from his boat. The proprietor of the places we rented related that his mother had once seen Nessie in the Bay.

By courtesy of the Lowrance sonar company, I was an observer at Operation Deepscan in 1987. I participated in the Loch Ness symposium at the Museum of Natural History in Edinburgh, also in 1987, and at the meeting in Drumadrochit in 1999.

I now believe that the Dinsdale film establishes decisively that Nessies are real, though my book on the matter (Bauer, 1986) did not aim to make that case but rather seeks to clarify the controversy. My most recent guess is that Nessies are relatives of something akin to turtles (Bauer, 2020), whose ancestry is close to that of plesiosaurs.

**Roland Watson:** My interest in the Loch Ness Monster began as a school kid back in the 1970s when I can recall the excitement over the 1975 Rines underwater photographs. My first visit to the loch was back in 1982 as a student undertaking camera watches, traveling to each point by bicycle.

My interest abated as I pursued a career in England, but the belief in a monster, whatever it was, did not disappear. A return to Scotland in the 1990s rekindled interest as the Internet brought interested parties together. The annual trips resumed in the 2010s as I began blogging on the subject and authored three books (Watson, 2011, 2018, 2019). I now visit the loch several times a year, en-

gaged in the hunt.

Though proving monsters is not the aim here, the cases I cover are ones that I believe to be genuine sightings of the famous monster. Indeed, as far as classic photographs are concerned, I find it statistically improbable that no such clear photographs of the creature(s) would have been taken over the classic period of 1933-1975, let alone the last 90 years.

## EVIDENCE OF UNIDENTIFIED ANIMALS IN LOCH NESS

This essay is a critique of dogmatic assertions that Nessies definitely do not exist, not an attempt to make a convincing case that Nessies are real. So here, we merely survey the reliability and significance of the various types and individual pieces of evidence. Whyte (1958) and Witchell (1974) can be recommended for general background and context: histories of sighting claims; chronology of searches and investigations; reports of similar creatures from other lakes in Scotland and also around the world; possibly relevant folklore, legend, myth.

On any subject, the best evidence comprises objective data that are known to be genuine and that remain available for further examination. For animals, one wants an actual specimen, be it a carcass, a skeleton, fossil, or an authentic sample of DNA. For Nessies, so far, none of these are at hand.

### The Best Objective Data About Nessies are Films

The first two of the following films were taken long before they could have been faked by computer programs, which nowadays would be quite feasible:

1. *Dinsdale (1960)*. This 16 mm film is available on the Internet<sup>7</sup>. A detailed description with still photos is in Bauer (2002), together with mention of pertinent TV documentaries. The film was examined by experts at Kodak and at JARIC (Britain's Joint Air Reconnaissance Intelligence Centre); the latter's report judged that it showed probably an animal, given that the hump was not a boat nor a submarine.
2. *Fraser (1934)*. A search organized by Sir Edward Mountain in the 1930s obtained a film whose present whereabouts are unknown; but it had been shown at a meeting of the Linnean Society. Experts on a range of aquatic creatures could not identify it, and the experts variously commented: "Not whale-like, maybe seal?"; "Exactly like seal"; "never seen seal swim like that"; "nothing like seal, just a common otter."<sup>8</sup>
3. *Peter and Gwen Smith (1977)*. The Smiths filmed from the shore a large object that rose vertically out of the water

briefly and then went down again; two boys in a boat saw the same thing<sup>9</sup>.

Other films have been claimed without making them available or providing other credible support, Mackal (1976, pp. 115, 290-294) lists 22 items, including Dinsdale and Fraser.

### Sonar

Sonar also delivers objective data, provided the charts or photos of screens are known to be authentic. However, interpreting sonar echoes involves assumptions, particularly about the density of the target when estimating size, and sonar delivers information about the shape of a target only if it is stationary and scanned slowly.

At Loch Ness, the sonar evidence stems from many different investigators over several decades and using many different types of equipment, reporting echoes from apparently large, moving objects. Several reports target moving up from and returning to deep water. There have also been a few reports of actual sonar tracking of moving targets. For details of these reports, see Bauer (2002) and Mackal (1976, pp. 123-132, 295-308). In 1987, during Operation Deepscan, technical experts from Lowrance Electronics interpreted three deep-water contacts that could not be later again located as bigger than sharks and not from fish shoals (Bauer, 1987).

Cruise boats and individual boaters continue to report deep-water contacts<sup>10</sup>.

Webcams have been in place at Loch Ness for years<sup>11</sup>. As yet, they have not delivered any definitive data.

### Environmental DNA (eDNA)

eDNA also constitutes objective data. Pioneering eDNA work at Loch Ness was carried out by Professor Gemmell's team in 2018 (Bruce, 2018). A surprising variety of species was detected, including some land-based creatures. However, some species known to be there did not leave DNA among the collected samples: otters, newt, carp, and roach<sup>12</sup>, illustrating that sampling of the waters cannot be guaranteed complete, because it requires that target species must have been in sampled places fairly recently.

25% of the collected DNA bits remain unidentified. The deepest water was not well sampled, and sampling was done over a period of only two weeks. The possible presence of a species related to turtles (Bauer, 2020) was not excluded<sup>13</sup>.



**Figure 1.** Surgeon's Photo to Loch Ness Monster (First published in *Daily Mail*, 21 & 23 April 1934).

### Surface Photos

The authenticity of all the claimed photos of Nessies at the surface has been questioned, and quite a few are generally agreed to be hoaxes or misinterpretations<sup>14</sup>. The commonly cited photos are reproduced in many books, for instance, Dinsdale (1961-1982), Mackal (1976, pp. 93-114), Watson (2019), Whyte (1957), and Witchell (1974-89). The iconic image is the 'Surgeon's photo' (Figure 1).

Martin and Boyd (1999) obtained a deathbed confession from a claimed perpetrator that this is a fake, but the credibility of this story is itself questionable for several reasons (Shuker 1995, pp. 87-8).

### Underwater Photos

Searches organized by Robert Rines obtained underwater photographs using strobe lighting and simultaneous sonar observation (Mackal, 1976, pp. 277-288). In 1972, two photos showed a flipper-like shape; in 1975, one photo could be interpreted as a head with small projections and an open mouth, and another looked like the front of a body attached to a long neck. Here too, there has been controversy over computer-enhancing and misinterpretation.

### Eyewitness Accounts

Reports by eyewitnesses are the earliest claimed evidence, but of course, they are also the least objective and certainly not available for re-examination. Mackal (1976, pp. 83-92, 223-268) mentions 10,000 reported sightings and gives details of 251 that he considered authentic, categorized by frequency of observation and by time of day and season of the year. Bauer (1986, pp. 169-200) lists

sighting reports and their provenance from the oft-mentioned St. Columba story (565 AD/CE) to 1985. Watson has discussed a number of notable cases<sup>15</sup>.

### THE CASE FOR NESSIES

The range of evidence just listed suggests that the simplest explanation (recommended by Occam's Razor) is that all of it stems from the same phenomenon, namely, the existence of a herd of aquatic animals whose adults can be very large, comparable in size to large sharks. Bayesian statisticians would agree that the probability that Nessies are real is significantly increased by the synergy of so many different types of evidence (Bauer, 2022).

The detailed case for Nessies or their relatives is described in a number of books: Dinsdale (1961-82), Gould (1934), Heuvelmans (1968), Mackal (1976), Oudemans (1892), Watson (2011, 2018, 2019), Whyte (1957), Witchell (1974-89). Bibliographies of pertinent published material are in Bauer (1980, 1982, 1986, pp. 201-233). Roland Watson's blog posts<sup>16</sup> have covered the range of evidence and controversy. Less systematic or less available material includes Newsletters of the Loch Ness Investigation (Bureau), which was active in the 1970s; Gary Campbell's *Newspaper* and website<sup>17</sup>; and Rip Hepple's *Nessletters*.

### The Debunkers' Cases

In the absence of a type specimen, definitive proof that Nessies are real remains obviously lacking. But why should it seem so important to anyone to assert that Nessies definitely do not exist? After all, definitive proof of that is also lacking; indeed, it is not obvious what could constitute such certifiable proof: draining the Loch?

If the disbelievers were satisfied with saying that proof requires a physical specimen and that they do not accept the available evidence as decisive, one would not quarrel with them. What is uncalled for is the insistence, which goes beyond the evidence, that Nessies definitely *do not exist* and that seeking to find and identify them is pseudo-scientific.

While believers are reassured by the cumulative significance of the range of evidence — films, sonar, eyewitnesses, photos — the doubters have to offer *separate and different* explanations for each type and bit of evidence.

The case against Nessies has been argued by two groups of people:

- *Frustrated erstwhile Nessie believers who became determined debunkers*: Binns (1983, 2017, 2019); Harmsworth (2010); Raynor<sup>18</sup>; Shine (2006).
- *People who campaign against pseudo-science in general and include Nessie-seeking in that category*: Camp-





**Figure 2.** Morar Wake (Binns 1983, fig. 14, p. 117).

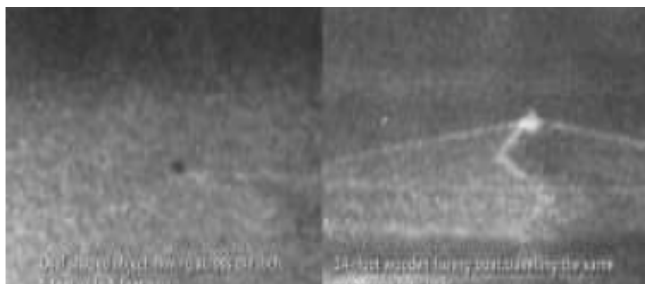
bell (1986); Gordin (2021); Loxton & Prothero (2012); McIntyre (2021); Naish (2013, 2017); Prothero (2013); Radford & Nickell (2006).

The latter group insists that seeking Nessie is unscientific, but that argument amounts only to asserting that *contemporary scientific consensus* do not recognize the existence of Nessies. That falls far short of proof of non-existence, nor does it explain what might be unscientific about searching for more evidence by people who happen to be interested. Nessie-seeking differs inevitably from professional, scientific activity (Bauer, 1986, pp. 76-79), but amateurs are quite capable of doing good science — they continue to make important discoveries in astronomy, for instance.

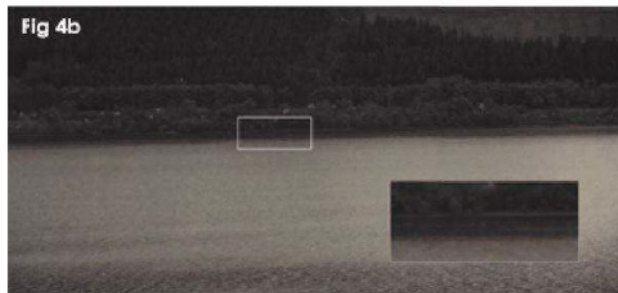
Both debunker groups make the same criticisms of the claimed evidence. They concentrate at length on the weaknesses of *the weakest evidence* while failing to undermine decisively the most objective data: film and sonar. Such failure is an all-too-common practice among those who decry various ‘denialisms’, the questioning of some mainstream scientific consensus. Sadly, would-be debunkers also frequently get important facts wrong.

**The Dinsdale Film**

Disbelievers have found no way to discredit this, the strongest objective evidence that unidentified animals



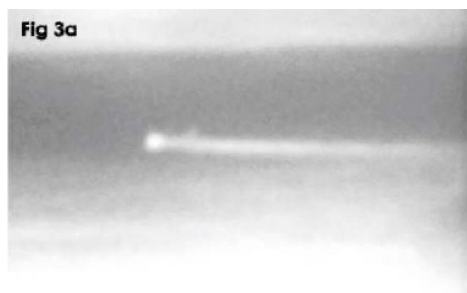
**Figure 3.** Hump and Control Wakes (Attribution: See Endnote 7).



**Figure 4.** Shine’s 4a, 4b (Attribution: See Endnote 19).

exist in Loch Ness. Their only recourse has been to assert that the filmed dark hump must be a misidentified boat. All can judge for themselves by viewing the film<sup>7</sup> whether that claim is sustainable, perhaps particularly when the dark hump submerges yet continues to throw up a large wake with no solid object visible above the surface.

Binns (1983, pp. 107-125) was the first to publish the assertion that the hump is a misidentified boat and has repeated the claim decades later (Binns, 2017, 2019). But his lengthy diatribes offer no substantive grounds for questioning the JARIC inference that the hump is an animal. He disputes that the wake made by the hump is significantly different from the wake of the boat that



**Figure 5.** Shine’s 3a, 3b (Attribution: See Endnote 19).

Dinsdale filmed as a control, and to support that claim offers his Fig. 14 (preceding p. 117), reproduced here (Figure 2), which shows a boat on *Loch Morar*, not *Loch Ness*, and moving *toward* the camera, which vitiates any critical comparison of the wake with that of Dinsdale's hump, where the hump *leaves behind* no central propeller wash whereas Dinsdale's control boat does (Figure 3).

Determined efforts to film a boat on Loch Ness, that could look something like the hump in Dinsdale's film, have been made by Richard Carter, Dick Raynor, and Adrian Shine<sup>19</sup>, all of them long familiar with Loch Ness and Nessie matters; but their filming of a boat was unable to achieve anything even suggestively like the Dinsdale hump<sup>20</sup>.

Steuart Campbell (1986) questioned JARIC's estimate of the speed of Dinsdale's hump as reaching 10 mph and thereby excluding the possibility that it was a fishing boat. That argument rests on mere speculations: when and for how long did Dinsdale pause filming to rewind the camera's clockwork mechanism? Was his account accurate as to the height above the Loch? Campbell's discussion was reviewed rather unfavorably by naturalist Richard Fitter (1988).

At some later date, Adrian Shine disseminated to interested people "The Dinsdale Loch Ness Film. An Image Analysis"<sup>19,20</sup>. He cited Campbell's critique as accurate, and claimed that the Carter-Raynor-Shine exercise showed that "a dingy could account for the significant features seen in the Dinsdale film." But, Shine's Figures 4a,b (Figure 4), are so dark and unfocused as to be useless.

Shine also asserted that the last portion of the Dinsdale film, where the large wake travels right to left, shows the head of a helmsman a little behind the splashes near the wake. It needs to be appreciated that Shine's assertions are based on a poor, third-iteration copy of the film, taken from a television screen playing a documentary that included a piece of the Dinsdale film (Harmsworth, 2010, pp. 128ff). Shine's Figure 3a is supposed to reveal the helmsman's head, purportedly similar to an actual boat (his Figure 3b and Figure. 5).

We beg to differ over that alleged similarity. Furthermore, Dinsdale's original film had been scanned and computer-examined by Alan Gillespie at the Jet Propulsion Lab without any such helmsman showing up. Bauer had a 16 mm copy of the film (given him by Dinsdale) commercially digitized and found no hint of such a helmsman's head; more recently, a computer scientist at Virginia Tech had the pertinent frames scanned, and there was again no sign of the alleged head<sup>21</sup>.

In his book, Shine (2006) reproduced his Figs. 3a,b and asserts that "members of the original 'JARIC' assessment team" now agreed that the hump "has the overall

appearance of a small craft with a feature at the extreme rear; consistent with the position of a helmsman." We beg to differ again and urge readers to compare the Figures. The alleged concurrence of the JARIC member was shown in a TV documentary (Harmsworth, 2010, p. 129), with Shine standing over the seated man and demanding his assent in a bullying manner.

Later debunking accounts usually cite Binns (1983), Campbell (1986), or Shine as proof that Dinsdale's hump is a boat (Loxton & Prothero (2012, ch. 4)<sup>22</sup>. Naish (2017; pp. 97ff) offers the entirely unsupported speculation that "if the boat . . . were dark-coloured and if the weather conditions . . . were more overcast, it would look about identical to the 'monster hump'". Harmsworth (2010, pp. 128ff) argued the same points as Shine and indeed participated in the first imagining of a helmsman in a TV documentary.

Radford and Nickell (2006, p. 8) acknowledge that Nessie is the global iconic lake monster, and they promote their own book on lake monsters as ground-breaking — yet over Loch Ness, they defer entirely to Binns:

Rather than simply cataloging the sightings, we have chosen a different path: in-depth, hands-on investigations. The result, we hope, is thorough enough and scholarly enough for avid lake monster researchers and entertaining enough for mystery lovers and armchair crypto-zoologists alike. Readers will also get a taste of what it's like to work alongside us as we plunge into the depths of these mysteries firsthand — with the exception of Loch Ness. Although the Loch Ness monster is the world's most famous, in some ways, that makes it less interesting from an investigative standpoint. The loch has been continually and meticulously searched, and although we hope to investigate it ourselves someday, there was little new that we could bring to the mystery for now. For a careful and critical examination, see Ronald Binns's book *The Loch Ness Mystery Solved*

Anyone who has followed the nearly century-long modern interest in Nessies recognizes as sheer ignorance a claim that the Loch has been "continually and meticulously searched"; there have been many searches, but many time-spans and many locations have not been examined, most pertinently the deepest basins.

### Sonar Echoes

Disbelievers need to explain away *frequent* sonar

echoes, to the present day<sup>10</sup>, from apparently large, often moving targets, with a few reports of tracking a moving target (Bauer, 2002; Mackal, 1976, pp. 123-132, 295-308).

Binns (1983, pp. 146-155) emphasized the inconclusive results of two expeditions by Cambridge students. He asks why other fishing trawlers passing through the Loch did not observe a Nessie since, in 1954, a trawler had apparently done so — a rhetorical question absurd on its face. The significant results obtained by electrical engineers from Birmingham University are denigrated because more were not obtained, which is rather absurd again. The underwater photos with simultaneous sonar echoes obtained by the Robert Rines teams are denigrated by innuendo, as are the other side-scan sonar echoes.

Shine (2006) argued that all sonar echoes result from such artifacts as reflections from loch walls or from thermoclines or seiches or other wave effects. He discounts even the strong echoes from apparently large, rapidly moving objects that Shine's own team published in 1983 and which, according to Loch Ness Project insider Harmsworth (1985), were most likely not artifacts. Shine admits: "It is still true that most sonar expeditions have reported echoes they do not understand, as we have", including the three strong contacts from non-stationary objects made during Operation Deepscan (Bauer, 1987).

## Eyewitness Reports

The evidence of eyewitnesses tends to be very *subjectively* compelling, particularly when it comes from well-known people, but it is, *objectively* speaking, the weakest evidence. Here, we describe how the determined would-be debunkers of Loch Ness Monsters are obsessed with discrediting eyewitness reports, at times resorting to *ad hominem* allegations and other irrelevancies. The following examples also illustrate various logical fallacies that obfuscate the weakness of an argument. This is a perennial tactic exemplified in the story of the preacher's sermon notes: *Argument weak here — thump pulpit!*

The first example is, appropriately enough, the eyewitness testimony, which in 1933 set in motion the continuing modern-day phenomenon of the Loch Ness Monster. Local correspondent Alex Campbell wrote in the local newspaper<sup>23</sup>, headlined "Strange Spectacle on Loch Ness":

Loch Ness has for generations been credited with being the home of a fearsome-looking monster, but, somehow or other, the "water kelpie", as this legendary creature is called, has always been regarded as a myth, if not a joke. Now, however, comes the news that the beast has been seen once more, for on Friday of last week,

a well-known businessman who lives in Inverness, and his wife (a university graduate) when motoring along the north shore of the loch, not far from Abriachan pier, were startled to see a tremendous upheaval on the loch, which, previously, had been as calm as the proverbial millpond. The lady was the first to notice the disturbance, which occurred fully three-quarters of a mile from the shore, and it was her sudden cries to stop that drew her husband's attention to the water. There, the creature disported itself, rolling and plunging for fully a minute, its body resembling that of a whale and the water cascading and churning like a simmering cauldron. Soon, however, it disappeared in a boiling mass of foam. Both onlookers confessed that there was something uncanny about the whole thing, for they realized that here was no ordinary denizen of the depths because, apart from its enormous size, the beast, in taking the final plunge, sent out waves that were big enough to have been caused by passing steamer. (p. 5)

The couple were later interviewed, in November 1933, by Rupert Gould (1934, pp. 39-40), who refers to the object in view as "X":

Mrs. Mackay and her husband were driving from Inverness to Drumadrochit. At a point on the road almost opposite Aldourie Pier [which is on the other side of the Loch], Mrs. Mackay caught sight of a violent commotion in the water nearby, about 100 yards from shore. She thought at first that it was caused by two ducks fighting, but on reflection, it seemed far too extensive to be caused in this way. The commotion subsided, and a big wake became visible, apparently caused by something large moving along just below the surface. This wake went away across the Loch towards Aldourie Pier. Then, about the middle of the Loch [some 450 yards from her], the cause of the wake emerged, showing two black humps moving in line - the rear one somewhat the larger. The rear hump appeared first, and Mrs. Mackay took it for a whale on account of its blue-black color [she has often seen whales at sea]. The two humps moved with the forward-rolling motion of a whale or porpoise but always remained smooth in outline, exhibiting no traces of fins. They rose and sank in an undulating manner [as if sliding along a submerged switchback] but never went entirely out of sight. Mrs. Mackay estimated the overall length of the two humps at about 20 feet.

X, after rising, continued to move towards the pier for some distance. Then it turned sharply to port and, after describing a half-circle, sank suddenly with considerable commotion.

[Mr. Mackay, who was driving the car, only stopped in time to see the final commotion and a noticeable “wash” which came rolling onto the shore after X had sunk.]

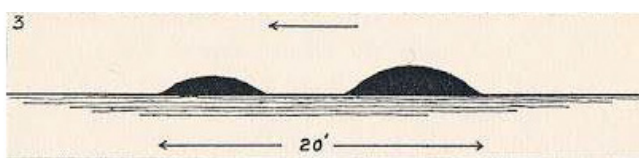
As the earliest primary sources for this claimed encounter, they should be used in any critical attempt to assess what was observed. One clear logical fallacy is the attempt to debunk this account by researcher Dick Raynor, who said concerning the first quoted version above<sup>24</sup>:

Despite everything else, the phrase “Loch Ness monster” does not appear in this article — for this, we have to wait until 9th June 1933. As for seals “not being definitely proved in Loch Ness”, we have references to them at Fort Augustus three decades earlier, and today it is not unusual to see them in Loch Ness. His successors in office slaughter them routinely. Had Campbell known that, he might have recognized a typical seal mating display in the detail of the Mackay’s account. (<http://www.lochnessinvestigation.com/history.html>)

**Onus probandi fallacy.** Raynor is right; seals can make their way into the loch, probably chasing fish; however, this is infrequent, two present simultaneously is quite rare, and they are usually shot within a short time:

“A Common or Harbour Seal *Phoca vitulina* L. lived in Loch Ness, Scotland, for seven months from November 1984-June 1985<sup>25</sup>. . . . This is the first time a seal has been proven in Loch Ness. Fishermen’s reports indicate that Loch Ness is visited by a seal approximately once every two years. . . . Two seals together were seen on two occasions. The number of seals reported by individual fishermen varied greatly: one man had seen six seals during the period, some men have never seen a seal yet” (Williamson, 1988).

Raynor’s proposed theory of two seals mating may seem like a real possibility to a lay audience, but it has no



**Figure 6.** Gould Sketch of Mackay Sighting (Gould, 1934).

evidentiary basis. It fails the logical fallacy of *Onus Probandi* or *Burden of Proof*: that seals may seem more probable than large, unknown animals does not absolve the need for some basis in actual evidence.

**Secundum quid fallacy.** Another fallacy is that of *Omission*, where part of the testimony is discounted since it would defeat the proposed explanation. In this case, the sketch below drawn up by Gould with the aid of Mrs. Mackay shows two humps each about six to seven feet long. Seals normally only show about two feet of their back on the surface. This conflict is “resolved” by invoking the sub-category of imperfect human observation, and that length is harder to estimate than color or shape. In relative terms, that is true, but invariably, it is implied in such analyses that it is a parameter that cannot be estimated and can, therefore, be ignored despite being one of the most important parameters in this debate.

**Ad ridiculum fallacy.** Allied to this is the logical fallacy of *Appeal to Ridicule*, which is exemplified here in the discounting of eyewitness observational skills on grounds of assumed incompetence. However, some eyewitnesses may be quite good at assessing objects on the loch fairly accurately, owing to their observing of the Loch in its various moods, and its inhabitant creatures, over years or decades: anglers, water bailiffs, tourist-boat operators. No account is taken of this by the disbelievers; everyone is brought down to the same level on the *a priori* assumption that there is no Loch Ness Monster: if you claim to see monsters, you must be an unreliable observer worthy of ridicule.

Since the Mackay case is a seminal account in the history of the phenomenon, it is especially targeted by debunkers: if you can debunk the initial mistake, what followed is already tainted. It is, therefore, no surprise that other critics have also taken up this case, though offering different explanations. Thus Steuart Campbell (2013) commented in *The Scotsman*:

I conclude that the Mackays saw Scot II’s wakes interacting as they collided with the shores of the narrower north-east end of Loch Ness and that the only monster in the lake at the time was Scot II. (<https://www.scotsman.com/news/opinion/columnists/steuart-campbell-say-goodbye-to-loch-ness-mystery-1579700>)

Scott II was a ferry boat with an ice-breaker hull which produced larger bow-waves than normal, and therefore bigger standing waves when conditions allowed. In fact, Scott II seems to have been a favorite attempted explanation by disbelievers of a number of sightings, during the boat’s service life-time. However, this explanation also

fails the burden of proof in not being properly tested. The assertion that standing waves are reinforced by reflection from the shore back into the loch is debatable, according to Dick Raynor<sup>26</sup>:

I often read about the divergent waves bouncing off the steep shores and being reflected back into the center of the loch to produce standing waves, but I have never seen that myself; I just see the waves break on the shore, and the energy is dissipated.<sup>26</sup>

The standing-wave argument also suffers from *Appeal to Ridicule* and *Omission* in that standing waves do not change direction as in the manner reported by Mrs. Mackay. That inconvenient statement is omitted, and once again, Aldie Mackay's observations are discounted on the grounds of presumed observational incompetence.

Last but not least, in this case, we come to Ronald Binns, who wrote about this sighting in his first book (Binns, 1983). Here, the logical fallacies take a different route.

**Ad hominem fallacy.** In his analysis, Binns does not just take aim at the message; his aim is to shoot the messenger. Binns unhesitatingly states things he cannot know, that Alex Campbell, who wrote the account for the *Inverness Courier*, "wildly exaggerated" because Campbell was "deeply committed to the belief that Loch Ness was the home of monsters" and wanted to promote it, by fair means or foul. Binns further employs hyperbolic language to further the *ad hominem* by referring to the *Courier* article as a "cumbersome and stilted piece of prose" and to Campbell as "the self-appointed high priest of the loch's mysteries" with "a great zest for publicity," thus an unreliable journalist, in order to undermine the Mackays' testimony.

No doubt Alex Campbell was an important figure in the story of Loch Ness, but that he was all too happy to be interviewed by the media is hardly proof of a large ego needing attention or fabricating newspaper articles.

The claims of exaggeration are shown to be unfounded by comparison with the Gould version. Binns minimally refers to this important corroboration as another recounting of the Mackay story "months later" and uses this to pick out two minor discrepancies in Campbell's account. One was that Mr. Mackay actually saw nothing and that Mrs. Mackay had only seen a "commotion in the water" akin to "two ducks fighting." That is all he says, and this is the weak basis for the accusation of wild exaggeration. Aldie Mackay had indeed initially thought the commotion was ducks but had then dismissed this notion quite promptly.

These four attempted explanations by three de-

bunkers are all rendered in assured tones, yet it is quite obvious that at least three of the possibilities must be wrong, and possibly all of them: Was it mating seals? Or boat wakes? Or fighting ducks? Or journalistic fabrication? Only in popular debunking would four quite different explanations apparently be deemed acceptable as proving something.

## CHANGING THE DATA TO FIT THE THEORY

The last example of fallacious reasoning has to do with the Spicer land-sighting of 1933. This was what effectively promoted the Loch Ness Monster mystery from a local to a national and international *cause célèbre*, beginning with George Spicer's (1933) letter to a local newspaper, referring to events thirteen days before:

Dear Sir,

I have just returned from a motoring holiday in Scotland and am writing to inform you that on Saturday afternoon, 22nd July last, whilst traveling along the east side of Loch Ness between Dores and Foyers Hotel, about halfway, in fact, I saw the nearest approach to a dragon or pre-historic animal that I have ever seen in my life. It crossed my road about fifty yards ahead and appeared to be carrying a small lamb or animal of some kind.

It seemed to have a long neck, which moved up and down in the manner of a scenic railway, and the body was fairly big, with a high back: but if there were any feet they must have been of the web kind, and as for a tail I cannot say, as it moved so rapidly, and when we got to the spot it had probably disappeared into the loch. Length from six feet to eight feet and very ugly.

I am wondering if you can give me any information about it, and am enclosing a stamped addressed envelope, anticipating your kind reply. Whatever it is, and it may be a land and water animal, I think it should be destroyed, as I am not sure whether had I been quite close to it I should have cared to have tackled it. It is difficult to give a better description, as it moved so swiftly, and the whole thing was so sudden. There is no doubt that it exists.

Yours etc,

G. SPICER

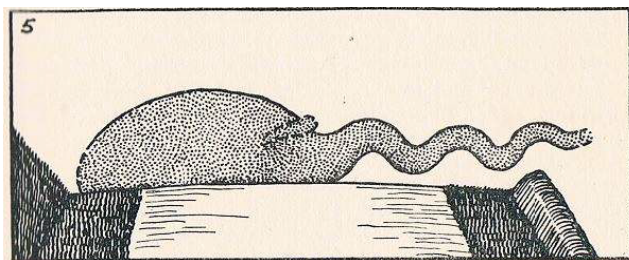
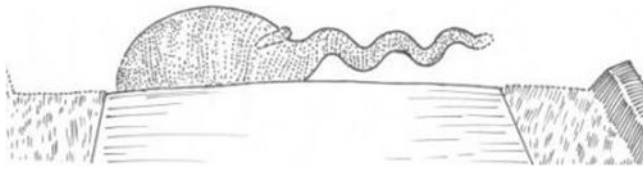


Figure 7. Gould Sketch of Spicer Sighting (Gould, 1934).



**Figure 8.** Lovcanski Reimagining of Gould Sketch (Lovcanski, 2010).

A meeting later in the year with the aforementioned researcher, Rupert T. Gould, led to the sketch below being published in his book (Gould, 1934, p. 43). The idea that such a creature could take to land has even led a few Nessie believers to challenge the account. But whether it is true or not does not excuse fallacious reasoning.

Once again, debunkers offer various theories, as though this were all that is needed to discredit the claimed event: a line of otters, a huddle of deer, or plain fabrication.

Alexander Lovcanski (2010) proposed a combination of otter and mirage effect on the hot road, causing an optical illusion, a light refraction owing to a temperature inversion that magnified the size of the animal. One could raise questions about the probability of the Spicers encountering an otter crossing the road through a heat haze, plus the question as to whether the nature of the road at that time could re-radiate sufficient heat. But Lovcanski argued that by wanting to change the data, the length of the creature should be shrunk to fill only the road and not the grass verges in the original sketch. He creates a new sketch, shown above.

The original account gave the length as from six to eight feet, but when George Spicer found out the exact width of the road, he felt compelled to revise the length to at least 25 feet (Gould, 1934, p. 46). There is no reason to doubt the accuracy of the original sketch, since Gould and the Spicers discussed the event and created the sketch together. George Spicer, as a direct witness, made this correction to the data, but has a debunker the same, right? The reason for the change was not to stay true to the original data but because the mirage theory would fall apart if it was actually a 25-foot creature. Lovcanski interprets the undulating neck as a distorting effect of the mirage on the otter's tail. However, Gould's sketch has that neck largely over the grass verge and beyond. The mirage can only be in effect over the hot surface of the road. It would not appear over the cooler grass and hence would invalidate Lovcanski's theory.

So, the entire undulating neck is squashed into the



**Figure 9.** MacNab 1 (Mackal, R., 1976. "The Monsters of Loch Ness", p. 274).

hot zone where a maximum illusion could take effect: the data are changed to fit the theory.

This approach is far from unique in Nessie debunking. It is seen across the board as key statements by eyewitnesses are altered from the actual original testimony. The most common tactic is to identify the object as a smaller animal, such as a bird, otter, or wave formation, on the grounds that such statements are the product of misperception involving the estimated size of the object. Shrink the object, and it begins to fit other known objects.

So, too, in the treatment of photographs. Consider the one taken by Peter MacNab on the 29<sup>th</sup> of July 1955, as described by him to author Nicholas Witchell (1974, p. 126):

I was returning from a holiday in the north with my son and pulled the car up on the road just above Urquhart Castle. It was a calm, warm, hazy afternoon. I was all ready to take a shot of Urquhart Castle when my attention was held by a movement in the calm water over to the left. Naturally, I thought of the 'Monster' and hurriedly changed over the standard lens of my Exakta (127) camera to a six-inch telephoto.

As I was doing so a quick glance showed that some black or dark enormous water creature was cruising on the surface. Without a tripod and in a great hurry I took the shot. I also took a very quick shot with another camera, a fixed-focus Kodak, before the creature submerged. My son was busy under the bonnet of the car at the time and when he looked in response to my shouts there were just ripples on the water. Several cars and a bus stopped but they could see nothing and listened to my description with patent disbelief.

The photograph was published in 1958, a week af-



**Figure 10.** MacNab 2 (Mackal, R., 1976. "The Monsters of Loch Ness", p. 274).

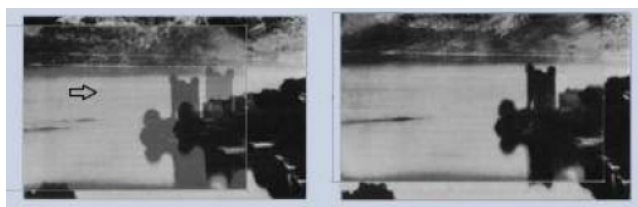
ter the same newspaper had published another picture allegedly of the monster. MacNab said he had taken his own picture three years before, but had withheld it for fear of ridicule. The publication of the other picture had seemingly emboldened him.

Skeptical interpretations have uniformly stated the object to be a form of boat wake, generated by one or more boats. Burton (1969) described it as the stern wave of a boat which had since disappeared out of camera view. Binns (1983, p. 101) modified this theory to make it a combination of three trawler-wakes constructively interfering to produce a more pronounced wave. However, he is not entirely convinced by his own theory, as the pronounced height of his proposed wave still looks unusually high. This has led others to suggest further that the humps in the image are actually painted onto boat wakes in the original picture and re-photographed. At this point, various commentators defer to the analysis of Roy Mackal, who claimed to have found problems with the photograph that render it inadmissible as evidence:

### Ignoratio Elenchi Fallacy

Mackal (1976, pp. 103, 273-276) compared a print of the MacNab image from earlier publications against one he personally obtained from MacNab. The image to the left in Figure 10 is from Whyte (1961), and the one on the right is what Mackal received from MacNab sometime before 1976. Mackal points out two discrepancies in his analysis. The first involves the presence of the foreground bush in the 1961 image, which is absent in his own copy.

Now, in terms of the way the later image was produced, there is no real argument. It is an enlargement taken from a negative either by the popular methods of contact printing or the use of an enlarger. The first involves placing the negative in intimate contact with photo-sensitive paper, and the second by projecting the image of the negative onto a screen holding the same type of paper. The latter method offers more opportunity to crop a projected image, depending on where the paper is placed under the beam. By performing an overlay of the two prints in question, one can see how the foreground



**Figure 11.** MacNab 3 (Watson, R.; Online. <https://lochnessmystery.blogspot.com/2012/02/analysis-of-peter-macnab-photograph.html>)

bush would be lost in the enlargement process. A series of simple measurements show that about 17% of the image has been cropped out at the bottom, left, and right.

The problem is not the enlargement but that, according to Mackal, MacNab could not give him an adequate explanation for why the two pictures were different. As a consequence, Mackal adds a needless layer of complexity in suggesting that the 1961 and 1976 prints "evolved" from an earlier original print. That inevitably allows the speculation that this theoretical original print may have had no monster on it at all.

A second objection concerns the 1976 print and its slightly squinted image of the castle and its reflection on the waters below. Mackal estimates that the tower skews to the left by about 4 degrees compared to the 1961 picture, and the reflection in the water skews a similar amount to the right. Mackal again suggests a reasonable explanation for this: the enlarging process used a camera mounted above the photo-sensitive paper with the camera slightly off-angle to the perpendicular.

An alternative possibility is that the original negative was not properly stored against the effects of humidity and sunlight in the twenty years since it was taken, and some degree of warping had occurred.

Ultimately, the picture is called into question for discrepancies that have adequate possible photographic explanations. Why MacNab could not simply tell Mackal that it was an enlargement is baffling, and there is no way now to get a definitive answer. The simplest explanation is that MacNab saw no issue with cropping out unimportant parts of the picture; several reproductions of it have cropped even more, without comment. The main point is that there is no evidence of deception on MacNab's part, nor any motive for such deception.

### DEBUNKING ARGUMENTS NOT DIRECTED AT SPECIFIC EVIDENCE

Some commonly made arguments are quite non-specific, unfalsifiable, and carrying no weight.

#### No Such Creatures are Known to Science

'Not known to science' really stands for 'cannot

imagine such creatures existing', and there are certainly grounds for mystification:

- If they are air-breathers, as all guesses about them conclude, why are they seen so rarely at the surface?
- If they are not air-breathers, why do they ever come to the surface?
- What about the claimed sightings on land? (Watson, 2018).

Questions awaiting answers do not constitute evidence against, however, let alone proof. Asserting that science's contemporary inability to offer plausible candidates proves non-existence entails utter belief in contemporary scientific knowledge as final and complete, an attitude known as *scientism*, having religious-type faith in science. That does not comport with the fact that science is an empirical, fallible, human activity.

In any case, it surely remains possible to discover new species, even of large size or long thought extinct. Nessie fans cite the coelacanth, discovered in 1938, and the megamouth shark, discovered in 1976. Both are deep-dwelling aquatic animals.

### Systematic Surveillance has not Produced Convincing Photos or Films

Surface sightings are rare; as Adrian Shine once commented, waiting for a surfacing is a war of attrition against the laws of chance. This merely confirms the belief that Nessies are habitually deep-dwelling.

### No Carcass of a Nessie has Ever Been Found

The implication is that carcasses *should* turn up if Nessies are real, but there is no warrant for such an assertion<sup>27</sup>. Deep-dwelling creatures will deposit their carcasses in the depths, where they will likely be used as food by fish or by their cannibalistic kin. Eels are abundant at the depths of Loch Ness; in 1966, for example, Hungary imported 2,500,000 fry and 800,000 young eels from Loch Ness<sup>28</sup>.

### There is Not Enough Food for a Herd of Large Predators

Comprehensive data yield an estimated 169-186 tons of aquatic bio-mass, "enough food . . . to viably sustain a number of large and unknown creatures"<sup>28</sup>.

### Traditional Folklore and Legends about Kelpies, Water Horses, and the Like Have Caused Observers to Interpret Natural Phenomena as Stemming from Nessies

Such folklore concerns bodies of water in general, so one would expect Nessie-type reports from Scottish lochs in general. However, it turns out that water horses are much more frequently mentioned in connection with Loch Ness than with other lochs (Watson, 2011).

Furthermore, if Nessies are real, surely they are large and remarkable enough to be featured in local folklore. Several disbelievers have suggested that people imagined seeing a Nessie because of the influence of the monster movie, *King Kong* ("one of the biggest pop-cultural events of 1933", Naish, 2017, p. 84).

### Photos are Either Hoaxes or Misleading in Some Way

That many photos may be misleading, and that many hoaxes have been perpetrated, is actually irrelevant to the issue of whether Nessies are real.

### THE MOST PROMINENT CONTEMPORARY AND RECENT DEBUNKING

Probably the best-known and influential source of assertions that Nessies are definitely not real is Adrian Shine's Loch Ness Project. It is based in the Drumnadrochit Hotel, in a commanding position on the main (western) road along Loch Ness, the A82, with signs prominently declaring it to be the Loch Ness Centre and Exhibition; a pond next to the main building features a floating model of Nessie. The Exhibition was founded by Harmsworth in 1979, and Shine himself has been there since the early 1980's. This longevity, together with the prominent location, makes Shine the obvious go-to person in the eyes of the media; he is featured in many TV documentaries and is often cited in news items.

Shine's monster-related doings began in the early 1970's when he participated in the search for Morag, Nessie's cousin in Loch Morar. Shine's courageous and determined efforts there included long submersions in a self-built spherical observation chamber. He called his efforts the Loch Morar Project. Frustrated over the lack of results, he moved his base of operations to Loch Ness as the Loch Ness and Morar Project, and in the later 1980s, the reference to Morar was dropped.

The original Harmsworth Exhibition had emphasized the evidence that Nessies are real, though Harmsworth (1985) admitted that his personal belief fell short of proof. Shine eventually took over the Exhibition and slowly changed its emphasis to a study of Loch Ness itself, ascribing all monster reports and assertions to misperceptions of natural phenomena, including such creatures as seals or sturgeon. Shine's present opinions and the nature of the exhibition are a naturalistic debunking, set out



in the booklet *Loch Ness* (Shine, 2006).

Binns has reiterated the points made by disbelievers in his 1983 book in two more recent volumes, 2017 and 2019. Here are short reviews of these works:

### **Adrian Shine (2006): *Loch Ness***

This little booklet of 30 pages is really a description of the Loch Ness Exhibition. Fewer than half of the pages even mention ‘monster’, and then invariably in a negative way. Although the marine clam shell found by Rines and shared with the Loch Ness Project is mentioned (p. 5), its carbon-dated age is not; yet that date contradicts Shine’s assertion (2006, p. 2) that the ocean did not flood the Loch after the last Ice Age.

There is a courteous acknowledgment of the sincerity of eyewitnesses, together with dismissing the possibility that any of the reported sightings are of an unidentified animal. Even so, the pamphlet says, “Yet elements of the sighting record were and still are, very compelling; particularly close encounters before the sensation of 1933” (Shine, 2006, p. 25). Charts are reproduced of the three deep-water contacts made during Operation Deepscan and attributed to artifacts, despite the acknowledgment that “most sonar expeditions have reported echoes they do not understand” (Shine, 2006, p. 24).

### **Ronald Binns (1983): *The Loch Ness Mystery Solved***

As detailed earlier, Binns’ argument that the Dinsdale hump was a boat simply does not hold water, so to speak; and his critique of the frequent sonar-contacts is similarly ineffective (he might not yet have known of the striking results published by the Loch Ness & Morar Project in 1983). Only 25 of the book’s 220 pages deal with the strongest objective evidence for Nessies: sonar and the Dinsdale film. The rest of the book is replete with factual errors, misleading statements, innuendo, and *ad hominem* slurs about Dinsdale and many others. Binns asserts much that he could not know: Dinsdale “tossing endlessly in his sleep” (p. 107), “in a state of considerable fatigue . . . in such a condition of stress and nervous excitement” (p. 109), “deeply excited . . . on the brink of nervous exhaustion . . . [yet] overwhelmed with excitement” (p. 110), “Filled with new hope . . . Shaking with excitement” (p. 111), “excitedly drove” (p. 112).

A full and negative dissection of Binns’ book has been published by Bauer (1985). Shine (1985) remarked on some of the same flaws in the book. Watson published on amazon.com<sup>29</sup> a lengthy critique of Binns’ maligning of Alex Campbell.

### **Ronald Binns (2017): *The Loch Ness Mystery Re-***

### ***loaded***

This book adds nothing new to what Binns wrote in 1983, as he himself admits: “not so much a sequel . . . as an appendix” (p. vi). It has the flaws of the earlier book: innuendo, *ad hominem* slurs, reiteration of trivialities, but no convincing criticism of the objective evidence of film and sonar. Indeed, repeated (p. 13) is the absurdity that “The case for the Loch Ness monster rests overwhelmingly on eye-witness evidence.”

Binns makes extraordinary claims for the 1983 book: “how influential it was, “pioneering analysis,” “stood the test of time” (p. 7); “full of gentle wit . . . iconoclastic” (p. 10); “it exploded beneath the complacent certainties of Loch Ness Monster orthodoxy with all the force of a small nuclear detonation” (p. 14).

The 1983 volume did have a bibliography and index, and its assertions were sourced in footnotes. The 2017 book has no index or bibliography, and the end notes are entirely inadequate; thus, without any documentation, Binns charges that “as more and more of the classic evidence collapsed even Witchell eventually performed a spectacular and astonishing somersault, though he did so in silence, without a word of explanation” (pp. 8 and 14). Rines’s Academy of Applied Science was “made up of businessmen, not scientists” (p. 11). *Wrong*: Rines’s teams included Harold Edgerton, inventor of strobe photography and recipient of USA’s Medal of Freedom, as well as Kodak’s photographic expert Charles Wyckoff and sonar designer and manufacturer Marty Klein.

There is no point in detailing all the false statements, undocumented speculations, and derogatory references to many people; there is nothing of substance in this “appendix” to the 1983 book. An example of Binns’s arrogant hubris is when he criticizes Williams (2016) for “a very inadequate index” (p. 151) in a Binns book *that has no index at all*.

### **Ronald Binns (2019): *Decline and Fall of the Loch Ness Monster: Contested Histories and Revisionist Tales***

This book has the same unappealing features as the 1983 and 2017 volumes, including the lack of an index; and as also in the 1983 book, Binns makes statements that are simply wrong, for example, “There is not even a bibliography of writings about the Monster” (p. 11). What about Bauer (1980, 1982)? And Bauer (1986, pp. 201-233) which lists books, articles, newspaper reports as well as sighting reports and their provenance (Bauer, 1986, pp. 169-200)?

Nicholas Witchell was alleged in Binns (2017) to have become a non-believer, a charge of “apostasy” repeated

here (p. 11); yet Witchell is also, later in the book, called “congenitally incapable of engaging with the skeptical case against Nessie” (p. 222). A similarly recent *Time* story (Greenspan, 2019) still cites Witchell’s book without warning readers of any change of belief on the part of the author.

Also reiterated is the ludicrous claim that the hump’s wake is just like that of a boat: “The screw wake the object leaves is perfectly visible to anyone whose interpretive skills are not warped by a desire to see a monster” (p. 204). We leave it to the reader to look at the film<sup>7</sup> and judge that assertion.

A whole chapter is devoted to criticizing Bauer for various misdeeds, for instance: “It took Henry Bauer two years and one month to publish a review of *The Loch Ness Mystery Solved*” (p. 202).

My book (Bauer, 1986) is said (p. 207) to exclude “the arguments of both sceptics and the ‘wrong’ kind of believers,” yet the first two chapters are, respectively, “The monster is a myth,” presenting the evidence interpreted as against the reality of Nessies, and “The monster exists,” showing how the very same evidence can be interpreted as favoring the existence of Nessies.

“Lester Smith” (D. G. Gerahty), whom I cited for claiming to have invented Nessie, is described as a “minor novelist,” yet he was a best-selling author of several dozen works in mid-20<sup>th</sup>-century English-speaking countries, under the pen-names of Stephen Lister and Robert Standish. As in the 1983 and 2017 books, Binns knows what people were feeling and thinking; for example, what “surely earned him Bauer’s wrath” (p. 207).

Gareth Williams (2016) is criticized for saying that the 1987 symposium organized at the Edinburgh Museum of Natural History brought skeptics and believers together, but that is indeed what happened since the attendees included the skeptical Shine as well as Dinsdale and other believers: Henry Bauer, Richard Fitter, Paul LeBlond, Roy Mackal, and Robert Rines.

Binns denigrated the symposium since it was co-sponsored by the ‘so-called’ International Society of Cryptozoology; at the same time, he complains about not being invited to participate. Biologist Mackal’s credentials are queried as “irrelevant to the identification of a hypothetical lake monster” (p. 213). Shine and Martin are held to task for calling Bauer’s book “perceptive” and “describing well” the difference between science and fringe studies (p. 217).

Yet again, Binns fails to engage convincingly with the objective evidence of films and sonar. The book concentrates on the easy targets of eyewitnesses and photos, as well as second- and third-level nitpicking and *ad hominem* slurs at all and sundry. How shamelessly Binns

mischaracterizes what others have written is encapsulated by the following: “Concentrating exclusively on the case against the monster, *Arthur C. Clarke’s Chronicles of the Strange and Mysterious* reiterated key arguments by myself and Steuart Campbell and concluded: ‘While there is a chance, however faint, that such a creature may exist, the search is sure to go on’” (pp. 220-221). In actual fact, that book (Welfare & Fairley, 1980, pp. 108-115) lays out the positive evidence including the Dinsdale film and the underwater photographs and sums it all up anything but negatively: “If you want my personal opinion — on Mondays, Wednesdays and Fridays I believe in Nessie. . . .” It would also have been rather miraculous for this 1980 volume to reiterate “key arguments” — or anything else — from a 1983 book by Binns or a 1986 book by Campbell.

## DEBUNKING STRATEGIES, TACTICS, AND MOTIVATIONS

The earlier detailed deconstruction of the Nessie-debunking arguments reveals certain overall strategies and tactics. It illustrates what is often pointed out, that disproving lies or innuendo or illogicalities requires more effort and more words than it took to perpetrate the lies, innuendos, and illogicalities. Having given ‘chapter and verse’, we can now summarize.

The main strategy that debunkers share is that of subtle misdirection, the strategy used by stage magicians: diverting the audience’s attention to something other than what the magician actually does. One common technique of misdirection is to concentrate at great length on the weakest evidence, as detailed above: the variations, inconsistencies, and changes of stories over time of eyewitness reports; still photographs, some of them fakes; much relating of hoaxes, and generalities about human psychology and myths and legends.

A second equally common method is to argue that because the topic is not within mainstream science, it is pseudo-science, and therefore, it is wrong. Because ‘science’ has such prestige and status, many people fail to notice that “not science” is not the same as ‘not true’, and pundits encourage that illusion: “Scientific consensus is the gold standard for rational belief” McIntyre (2021, p. 137), reflecting a belief in the ideology of scientism, that science and only science certifies truth. These critics often self-label as ‘Skeptics’<sup>30</sup>, but since they specialize in debunking and are not at all skeptical about mainstream science, the contemporary ‘scientific consensus’, these self-labeled Skeptics are actually *pseudo-skeptics* (Truzzi, 1987).

Arguing under the banner of ‘Skeptic’, and under the ideology of scientism, again illustrates the strategy of

misdirection: discussing at great length, how to distinguish science from not-science, philosophy's 'demarcation problem', draws attention away from all that really matters: the actual specific evidence.

Some of the most determined arguers that Nessies definitely do not exist are, as earlier noted, erstwhile believers: Binns, Shine, Richard Carter, and Dick Raynor. Steuart Campbell might also be included in this group in a more general way since he had been positively interested in such anomalies as UFOs before taking up science<sup>31</sup>. That true believers who lose faith become dogmatic non-believers rather than open-minded genuine skeptics is quite a general phenomenon, illustrated in politics by those who lost Communist faith and became the most vigorous anti-Communists, say Arthur Koestler or Whitaker Chambers.

The same strategies and tactics are employed by those who include Nessie-seeking as they disparage all 'pseudo-science', for example, Loxton and Prothero (2012) and Radford and Nickell (2006). Historian Michael Gordin (2021), too, used Nessie as an example in asserting riskiness in believing in 'fringe science'.

Those interested in or speaking for the reality of Nessies do not claim *final proof*; only that sufficient evidence exists to warrant serious research. Debunkers, on the other hand, not only argue by misdirection, but they also commit the irrationality of trying to prove *beyond any doubt* that *a certain thing does not exist* or *a certain thing never happened and never could happen*. Those who try to prove such a negative ought to be reminded that 'absence of evidence is not evidence of absence'.

## ENDNOTES

- 1 [www.henryhbauer.homestead.com](http://www.henryhbauer.homestead.com); [henryhbauer@gmail.com](mailto:henryhbauer@gmail.com)
- 2 <http://lochnessmystery.blogspot.com>; [shimei123@yahoo.co.uk](mailto:shimei123@yahoo.co.uk)
- 3 For example, Douglas Charles, "Scientists now say existence of Loch Ness Monster is 'plausible' after unexpected fossil discovery," 27 July 2022; <https://brobible.com/culture/article/scientists-loch-ness-monster-plausible-fossil>
- 4 Jack Butler, "Against Loch Ness Monster clickbait", 28 July; <https://www.nationalreview.com/corner/against-loch-ness-monster-clickbait>
- 5 For details of those many possibilities, see the Appendix in Bauer (2022).
- 6 Houran, J. & Bauer, H. H. (2022). 'Fringe science' — A tautology, not pariah. *Journal of Scientific Exploration*, 36, 207-217; Bauer, H. H. (2014). Shamans of scientism: Conjuring certainty where there is none. *Journal of Sci-*

*entific Exploration*, 28, 491–504.

- 7 <https://www.themanwhofilmednessie.com/tims-nessie-film.html>
- 8 *Proceedings of the Linnean Society*, Pt. 1, 8 November 1934, pp. 7-12.
- 9 [http://www.nessie.co.uk/htm/the\\_evidence/cine1.html#26](http://www.nessie.co.uk/htm/the_evidence/cine1.html#26); <https://www.youtube.com/watch?v=aFKlnhGvhfc>; [http://lochnessmystery.blogspot.com/2015\\_05\\_31\\_archive.html](http://lochnessmystery.blogspot.com/2015_05_31_archive.html)
- 10 <http://lochnessmystery.blogspot.com/search?q=sonar>
- 11 <https://worldcams.tv/united-kingdom/inverness/loch-ness>
- 12 <https://lochnessmystery.blogspot.com/2019/10/looking-back-on-edna-results.html>
- 13 Personal communication from Gemmell to Bauer, 29 September 2019.
- 14 <http://lochnessmystery.blogspot.com/2012/11/the-marks-of-honesty-and-deceit.html>
- 15 <http://lochnessmystery.blogspot.com/2011/08/classic-sightings.html>; [http://lochnessmystery.blogspot.com/2019/11/rain-mud-and-adrian-shine\\_16.html](http://lochnessmystery.blogspot.com/2019/11/rain-mud-and-adrian-shine_16.html); <http://lochnessmystery.blogspot.com/2013/09/logs-and-nessie.html>
- 16 <http://lochnessmystery.blogspot.com>
- 17 [https://www.lochness.co.uk/fan\\_club](https://www.lochness.co.uk/fan_club)
- 18 <http://www.lochnessinvestigation.com/>
- 19 [https://mega.nz/file/JX530AKC#FXp99K\\_F2lpVjy-6Q3ljh3ukb\\_0jnThXBaKS35r0Xq8w](https://mega.nz/file/JX530AKC#FXp99K_F2lpVjy-6Q3ljh3ukb_0jnThXBaKS35r0Xq8w)  
On a cryptozoology internet discussion forum, Shine once challenged Bauer to make available to him his copy of the Dinsdale film. In response, Bauer also detailed flaws in Shine's "Image Analysis" <https://mega.nz/file/RfAH3AzT#AsCygT2fEQquO9Oxk4vy7lMtc-D9g4rg9s881APV6e9l>
- 20 One of their failed attempts is shown in *Lake Monsters*, a Discovery Channel documentary produced by the BBC (Bauer, 2002).
- 21 <https://henryhbauer.homestead.com/DinsdaleFilm.html>
- 22 Bauer has published a full deconstruction of this critique: [https://henryhbauer.homestead.com/\\_NessieChapter.pdf](https://henryhbauer.homestead.com/_NessieChapter.pdf). Several very negative reviews of the book are on Amazon. com: [https://www.amazon.com/Abominable-Science-Origins-Nessie-Cryptids/product-reviews/0231153201/ref=cm\\_cr\\_unknown?ie=UTF8&reviewerType=all\\_reviews&filterByStar=one\\_star&pageNumber=1](https://www.amazon.com/Abominable-Science-Origins-Nessie-Cryptids/product-reviews/0231153201/ref=cm_cr_unknown?ie=UTF8&reviewerType=all_reviews&filterByStar=one_star&pageNumber=1)
- 23 *Inverness Courier*, 2 May 1933.
- 24 <http://www.lochnessinvestigation.com/history.html>
- 25 This is presumably the seal whose head I observed lifted out of the water near Temple Pier in Urquhart Bay

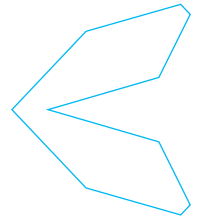
in May 1985.

- <sup>26</sup> Dick Raynor; [https://www.cryptozoology.com/forum/topic\\_view\\_thread.php?tid=5&pid=828745](https://www.cryptozoology.com/forum/topic_view_thread.php?tid=5&pid=828745)
- <sup>27</sup> <http://lochnessmystery.blogspot.com/2014/05/the-carcass-problem-part-2.html>
- <sup>28</sup> [http://lochnessmystery.blogspot.com/2012/02/is-there-enough-food-for-nessie\\_12.html](http://lochnessmystery.blogspot.com/2012/02/is-there-enough-food-for-nessie_12.html)
- <sup>29</sup> <https://www.amazon.com/dp/0729101398#customerReviews>
- <sup>30</sup> Iconic of self-styled Skeptic is the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), founded in 1976 and since 2006 just CSI; website is now <https://skepticalinquirer.org>, the organization's journal.
- <sup>31</sup> Personal communication to Henry Bauer, May 1985.

## REFERENCES

- Bauer, H. H. (1980). The Loch Ness Monster: A guide to the literature. *Zetetic Scholar*, 7 (December), 30–42.
- Bauer, H. H. (1982). The Loch Ness Monster: A guide to the literature — Supplement I. *Zetetic Scholar*, 10 (December), 26.
- Bauer, H. H. (1985). Review of Binns [1983]. *Nessletter*, 70, June. [Online: <https://mega.nz/file/weAGkQTD#NWN-Lfw0ScOMuS2dSeOqSZ5Yr7AUp2ExQAUtyod-4Fok>]. A shorter version is in *Fortean Times*, 46, spring 1986.
- Bauer, H. H. (1986). *The enigma of Loch Ness: Making sense of a mystery*. University of Illinois Press.
- Bauer, H. H. (1987). Operation Deepscan. *Nessletter*, 84, October (ISBN 0264-7001; Ness Information Service). [Online: <https://mega.nz/file/wTxjGKia#JUdcEF9GOj3Eooz81b9A-xzorKbpnN1xla4FrLsEreo>]
- Bauer, H. H. (2002). The case for the Loch Ness “Monster”: The scientific evidence. *Journal of Scientific Exploration*, 16, 225–246.
- Bauer, H. H. (2020). Loch Ness monsters as cryptid (presently unknown) sea turtles. *Journal of Scientific Exploration*, 34, 93–104. <https://doi.org/10.31275/20201713>
- Bauer, H. H. (2022). Occam's Razor and Bayesian measures of likelihood suggest Loch Ness monsters are real animals — An example of premature discovery with wider general implications. *Journal of Scientific Exploration*, 36, 740–748. <https://doi.org/10.31275/20222647>
- Binns, R., with R. J. Bell (1983). *The Loch Ness mystery solved*. Open Books Publishing (Star & Prometheus eds., 1984).
- Binns, R. (2017). *The Loch Ness mystery reloaded* (self-published, Zoilus Press).
- Binns, R. (2019). *Decline and fall of the Loch Ness Monster: Contested histories and revisionist tales* (self-published, Zoilus Press).
- Bruce, G. (2018). What lies beneath? The New Zealander on the trail of monsters. [Online: [https://www.nzherald.co.nz/lifestyle/news/article.cfm?c\\_id=6&objectid=12158631](https://www.nzherald.co.nz/lifestyle/news/article.cfm?c_id=6&objectid=12158631)]
- Bunker, G., Martill, D. M., Smith, R., Zourhi, S., & Longrich, N. (2022). Plesiosaurs from the fluvial Kem Kem Group (mid-Cretaceous) of eastern Morocco and a review of non-marine plesiosaurs. *Cretaceous Research*, 140. Article 105310. <https://doi.org/10.1016/j.cretres.2022.105310>.
- Burton, M. (1969). Letter to *New Scientist*, 23 January, p. 191.
- Campbell, S. (1986). *The Loch Ness Monster — the evidence*. Aquarian Press (later eds., Aberdeen University Press, 1991; Birlinn, 1996; Prometheus, 1997).
- Campbell, S. (2013). Steuart Campbell: Say goodbye to Loch Ness mystery. 14 April. [Online: <https://www.scotsman.com/news/opinion/columnists/steuart-campbell-say-goodbye-loch-ness-mystery-1579700>]
- Dinsdale, T. (1961). *Loch Ness Monster*. Routledge & Kegan Paul (2nd ed., 1972; 3rd 1976, 4th, 1982).
- Fitter, R. (1988). Review of Campbell (1986). *Cryptozoology*, 7, 95–97.
- Gordin, M. D. (2021). Fringe theories stack. *Aeon*, 10 February 2022. [Online: <https://aeon.co/essays/the-different-lives-of-fringe-and-strange-scientific-ideas>]
- Gould, R. T. (1934). *The Loch Ness Monster and others*. Geoffrey Bles (University Books, 1969).
- Greenspan, R. (2019). Thousands have ‘signed up’ to ‘storm Loch Ness’ and find ‘that big boy.’ Here's the history behind the mythical sea monster. *Time*, 23 July. [Online: <https://time.com/5631953/storm-loch-ness-history>]
- Harmsworth, A. G. (1985). *Loch Ness — The Monster*. Tilli-coultry: Peter Gray (Scotland) Ltd.
- Harmsworth, T. [A. G.] (2010). *Loch Ness — Nessie — and Me* (self-published, Harmsworth Consultancy).
- Heuvelmans, B. (1968). *In the wake of the sea-serpents*. Hill & Wang.
- Loxton, D., & Prothero, D. R. (2012). *Abominable science!: Origins of the Yeti, Nessie, and other famous cryptids*. Columbia University Press.
- Linnean Society. (1934). *Proceedings of the Linnean Society of London*, part 1, pp. 7–12, November 8.
- Lovcanski, A. (2010). Monster or mirage? *Skeptic online*, 30 August. [Online: <https://www.skeptic.org.uk/2010/08/monster-or-mirage>]
- Mackal, R. P. (1976). *The monsters of Loch Ness*. Swallow Press.
- Martin, D., & Boyd, A. (1999). *Nessie — the Surgeon's Pho-*

- tograph (self-published). ISBN 0 9535708 0 0
- McIntyre, L. (2021). *How to talk to a science denier: Conversations with flat earthers, climate deniers, and others who defy reason*. MIT Press.
- Naish, D. (2013). Photos of the Loch Ness Monster, revisited. [Online: <https://blogs.scientificamerican.com/tetrapod-zoology/photos-of-the-loch-ness-monster-revisited/>]
- Naish, D. (2017). *Hunting monsters: Cryptozoology and the reality behind the myths*. Arcturus (Kindle ed., 2016).
- Oudemans, A. C. (1892). *The great sea-serpent*. E. J. Brill (Leyden), Luzac & Co. (London); reprinted Arment Biological Press, 2000. [Online: <https://ia803207.us.archive.org/17/items/greatseaserpenth00oude/greatseaserpenth00oude.pdf>]
- Prothero, D. R. (2013). *Reality check: How science deniers threaten our future*. Indiana University Press.
- Radford, B., & Nickell, J. (2006). *Lake monster mysteries: Investigating the world's most elusive creatures*. University Press of Kentucky.
- Rines, R., & Dougherty, F. M. (2003). Proof positive—Loch Ness was an ancient arm of the sea. *Journal of Scientific Exploration*, 17, 317–323.
- Shine, A. (1985). Review of Binns (1983). *Cryptozoology*, 4, 83–86.
- Shine, A. (2006). *Loch Ness* (self-published, the Loch Ness Project).
- Shuker, K. P. N. (1995). *In search of prehistoric survivors*. Blandford.
- Spicer, G. (1933). *Inverness Courier*, 4 August.
- Sturrock, P. A. (2013). *AKA Shakespeare: A scientific approach to the authorship question*. Exoscience.
- Truzzi, M. (1987). On pseudo-skepticism (editorial). *Zetetic Scholar*, 12/13(August), 3–4.
- Watson, R. (2011). *The water horses of Loch Ness*. CreateSpace; ISBN 978-1461178194.
- Watson, R. (2018). *When monsters come ashore: Stories of the Loch Ness Monster on land*. CreateSpace; ISBN 978-1981279005.
- Watson, R. (2019). *Photographs of the Loch Ness Monster: The good, the bad, and the ugly*. Self-published, ISBN 978-1793256843.
- Whyte, C. (1957). *More than a legend*. Hamish Hamilton.
- Williams, G. (2016). *Monstrous commotion: The mysteries of Loch Ness*. Orion.
- Williamson, G. R. (1988). Seals in Loch Ness. *Scientific Reports of the Whales Research Institute*, 39, 151–157.
- Witchell, N. (1974). *The Loch Ness story*. Terence Dalton (later, 1975 [Penguin], rev. ed. 1976, 1979, 1982 [Corgi], rev. ed. 1989 [Corgi]).



COMMENTARY

## Commentary on Sheldrake and Smart (2023): Directional Scopaeesthesia

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The paper by Sheldrake and Smart (2023) concerns the feeling of being stared at, or scopaeesthesia. I here comment on the article whose rejection I had recommended in the process of peer review. My recommendation was based on the *Journal's* advice to referees, that claimed observations and proffered explanations could be more speculative or less plausible than in some mainstream disciplinary journals, but that '*those observations and explanations must conform to rigorous standards of observational techniques and logical argument*'. Sheldrake and Smart's contribution does not conform to these standards.

Examination of the "natural history" of scopaeesthesia by listing opinions of nearly a thousand "surveillance officers, detectives, martial arts teachers, celebrity photographers, wildlife photographers, and hunters" (p. 312) gives testimony to the widespread belief in the phenomenon but does not say anything about its existence beyond an object of belief. Therefore, the very first sentence of the Abstract offers a mixture of fact and fake information: "The sense of being stared at, or scopaeesthesia, is very common, and its existence is supported by experimental evidence" (p. 312). I agree with the first part of the sentence – obiquity and pervasiveness of the experience of scopaeesthesia have already been documented in a huge body of literature. I strongly disagree with the second part; experimental evidence for scopaeesthesia as an objective perceptual phenomenon is currently absent – again, rigorous research standards are assumed (see Carpenter, 2005).

What Sheldrake and Smart laudably recognize is the theoretical importance of the *directionality* of the phenomenon (under the assumption that it exists). That is, does the feeling of being stared at depend on the starrer's gaze direction? The question is not new; Sheldrake has presented it for a long time (e.g., Sheldrake, 2005). Analyses of the current case collection now provide a clear answer: people experiencing scopaeesthesia do report that gaze direction matters. This was to be expected as the direction of other people's gaze is an important cue for the judgment of social interactions (Gutersdam & Graziano, 2020a). But whether scopaeesthesia as a purported objective phenomenon profits from a directed gaze cannot be determined by the present data set. And previous tests suffered from the embarrassingly poor methodological standards they applied. For instance, Sheldrake (2003) introduced preliminary data collected in a binary decision paradigm in which an experimental starrer looked at a blindfolded person sitting in front of him via a mirror placed on the person's left or right side and indicating whether the starrer's gaze was felt from left or right by lifting her arm on the corresponding side. Success in such a paradigm depends on the trial-by-trial feedback provided in a long series of pseudorandomized sequences. Performance is thus an instance of implicit sequence learning and does not indicate the presence of a perceptual phenomenon (Brug-



ger & Taylor, 2003).

Interestingly, recent work on extramission theories of visual perception (i.e., the notion that something «leaves the eyes» in order to achieve a visual percept) has recognized that research should not be directed towards the “optics of extramission” but to the motor aspects of gaze direction (Schott, 2019). In a series of cleverly designed experiments, Arvid Gutersdam and collaborators have investigated the importance of gaze detection for the feeling of being stared at and the belief in an extramission component of visual perception (Gutersdam et al., 2019, 2020; Gutersdam & Graziano, 2020a, 2020b). In recognizing that scopaesthesia is a mere object of belief (and not a perceptual or attentional phenomenon), these authors have contributed to the biological bases of an individual’s specific irrational belief and, more generally, they have uncovered the roots of the formation and maintenance of the belief in scientifically unsubstantiated phenomena. This brings me to another citation from the article by Sheldrake and Smart, i.e., the title of their paper, “*Directional scopaesthesia and its implications for theories of vision.*” As scopaesthesia does not exist, it cannot have any implications on any theories of vision (nor on anything at all). It is *the belief in scopaesthesia* which makes it a valuable topic of the history and sociology of science. If folk psychological beliefs about extramission and the feeling of being stared at are held by the ‘folk of scientists’, this topic is especially interesting. It helps illustrate the relative resistance of paranormal beliefs towards education and delineates how the ‘madness of crowds’ (Mackay, 1841) can evade academic thinking.

In a nutshell, the article by Sheldrake and Smart falls short from being smart. The contribution is a useful illustration of the true-believer syndrome (Keene, 1976), the perseverative maintenance of a belief in phenomena whose existence has not been supported by any scientific exploration of acceptable quality standards.

## REFERENCES

- Brugger, P., & Taylor, K. I. (2003). ESP: Extrasensory perception or effect of subjective probability? *Journal of Consciousness Studies*, 10(6-7), 221-246.
- Carpenter, R. H. S. (2005). Does scopesthesia imply extramission? *Journal of Consciousness Studies*, 12(6), 76-78.
- Guterstam, A., & Graziano, M. S. A. (2020a). Visual motion assists in social cognition. *Proceedings of the National Academy of Sciences*, 117(50), 32165-32168.
- Guterstam, A., & Graziano, M. S. A. (2020b). Implied motion as a possible mechanism for encoding other people’s attention. *Progress in Neurobiology*, 190,

Article 101797. <https://doi.org/10.1016/j.pneurobio.2020.101797>

- Guterstam, A., Kean, H. H., Webb, Y. W., Kean, F. S., & Graziano, M. S. A. (2019). Implicit model of other people’s visual attention as an invisible, force-carrying beam projecting from the eyes. *Proceedings of the National Academy of Sciences*, 116(1), 328-333. <https://doi.org/10.1073/pnas.2003110117>
- Guterstam, A., Wilterson, A. I., Wachtell, D., & Graziano, M. S. A. (2020). Other people’s gaze as implied motion in the human brain. *Proceedings of the National Academy of Sciences*, 117(23), 13162-13167.
- Keene, L. M. (1976). *The psychic mafia*. St. Martin’s Press.
- Mackay, C. (1841). *Extraordinary popular delusions and the madness of crowds*. Richard Bentley.
- Schott, G. D. (2019). Exploring extramission. Plato’s intra-ocular “fire” revisited. *Perception*, 48(12), 1268-1270. doi: 10.1177/0301006619884208.
- Sheldrake, R. (2003). *The sense of being stared at, and other aspects of the extended mind*. Hutchinson.
- Sheldrake, R. (2005). The sense of being stared at. *Journal of Consciousness Studies*, 12, 10-31.
- Sheldrake, R., & Smart, P. (2023). Directional scopaesthesia and its implications for theories of vision. *Journal of Scientific Exploration*, 37(3), 312-329. <https://doi.org/10.31275/20232897>



COMMENTARY

# Response to Peter Brugger's Commentary

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Peter Brugger and we agree on several important points. We agree that most people believe in scopaesthesia based on personal experience. We agree about the importance of gaze detection for the belief in an extramission component of visual perception. We agree about the theoretical importance of the directionality of apparent scopaesthesia. We appreciate the clever research by Guterstam and his colleagues, which shows how people unconsciously attribute an outward movement of force to the gaze, implying the extramission of an invisible flow from the eyes towards the object of attention. As Guterstam et al. (2019) pointed out, even people who explicitly disbelieve in extramission implicitly take extramission for granted when tested, not knowing they are doing so; they suggest that this response and the brain mechanisms underlying it have deep evolutionary roots, probably connected with the importance of gaze detection in social contexts.

Our fundamental disagreement is about the reality of scopasesthesia itself. For Brugger, scopaesthesia simply does not exist, and to believe that it does is irrational. It is a 'folk psychological belief'. The only interesting questions are about the brain mechanisms that underlie this false belief.

For many years, Brugger has claimed that psychic phenomena are impossible. As he mentions himself, he is on the scientific advisory board of the principal skeptical organization in Germany, GWUP (Gesellschaft zur wissenschaftlichen Untersuchung von Parawissenschaften, or the Society for the Scientific Investigation of Pseudosciences). In his Commentary, he referred to a paper he published in 2003 with his colleague Kirsten Taylor in which they argued that positive results in parapsychological experiments occurred not because these phenomena are real, but because there was an implicit learning of pseudorandom sequences by subjects who were taking part in a long series of trials and given trial-by-trial feedback. They hypothesized that subjects recognized repetitive patterns in the randomized instructions because they were not properly randomized: through trial-by-trial feedback they could pick up repeated patterns unconsciously. This unconscious awareness of patterns in the randomness, or pseudorandomness, enabled them to give correct answers at above-chance levels (Brugger & Taylor, 2003).

Brugger and Taylor went on to speculate that the right cerebral hemisphere plays a central role in "cognitive mechanisms underlying the formation and maintenance of paranormal beliefs" (Brugger & Taylor, 2003, p. 221). They entitled their paper 'ESP', and suggested that this acronym for Extra-Sensory Perception should be reinterpreted to mean 'Effect of Subjective Probability'. They regarded this new definition as an extension of the standard skeptical quip that ESP means 'Error Some Place'. They proposed that henceforth "parapsychology should abandon the traditional causal view of ESP as extrasensory perception; it should be recognized that the object under study is individual differences in guessing behaviour." By giving up the idea that ESP is a real phenomenon and by discarding all the evidence for anything except subjective cognitive biases, "a new parapsychology could ultimately advance to a respectable discipline within the





behavioural sciences" (p. 222).

In this spirit, Brugger (2024) tries to brush aside the experimental results in dozens of papers on scopaesthesia in peer-reviewed journals on the grounds that subjects implicitly learned patterns in pseudorandomized sequences of "looking" and "not-looking trials" because, he assumes, they were given trial-by-trial feedback. To justify this sweeping condemnation, he cited just one study, a preliminary experiment that one of us (R.S.) carried out to test for directional scopaesthesia in randomized trials (Sheldrake, 2003). He stated, "Success in such a paradigm depends on the trial-by-trial feedback provided in long series of pseudorandomized sequences" (p. 169) and used this example to illustrate the "embarrassingly poor methodological standards" (p. 169) of the whole field of research. In fact, there was no trial-by-trial feedback in the study he cited, and the sequences were not pseudorandom. He made up these experimental details to fit his standard Error Some Place argument; he invented the "embarrassingly poor" methodology himself. Having erected a straw man, he then knocked it down in an attempt to discredit all research on scopaesthesia. He simply ignores the many studies in which randomizations were performed by standard techniques. He ignores the positive and statistically significant hit rates in studies in which subjects were not given feedback (Sheldrake, 2000, 2001, 2008), where there could have been no implicit learning of sequences and hence no Effect of Subjective Probability. He also ignores the positive and statistically significant results in randomized tests without feedback using CCTV (Schmidt et al., 2004).

Brugger is not alone in his contempt for evidence that does not agree with his worldview. Several leading skeptics explicitly argue that the data are irrelevant because psychic phenomena are impossible on logical grounds. They do not happen because they cannot happen. In his book *Rationality*, Steven Pinker (2021) freely admitted that he pre-judges the evidence for all kinds of ESP, assigning them an infinitesimal prior probability in the language of Bayesian statistics. Likewise, in a paper entitled "Searching for the impossible: Parapsychology's elusive quest" Arthur Reber and James Alcock, a leader in the organized skeptical movement, asserted that "Claims made by parapsychologists cannot be true. The effects reported can have no ontological status; the data have no existential value" (Reber & Alcock, 2019, p. 391). Why waste time looking at the empirical evidence if you know in advance that it is worthless?

The usual reason for committed skeptics' denial of psychic phenomena is their belief in the materialist or physicalist philosophy, according to which minds are what brains do; minds are confined to the insides of

heads (Sheldrake, 2020). Hence phenomena like telepathy and scopaesthesia are impossible because they could only happen if minds or mental influences extended beyond brains, which they do not. To believe that they do is to succumb to superstitious, irrational, and magical thinking.

Brugger, Guterstam, and other scopaesthesia skeptics regard the widespread *belief* in visual extramission and in scopaesthesia as a valid topic for scientific study because they assume it arises through brain mechanisms that have evolved for the detection of meaningful patterns and the direction of gazes. These mechanisms then give rise to illusions about visual extramission. However, an evolutionary argument would make more sense if visual extramission and scopaesthesia are real. For example, an ability to detect the stare of a hidden predator may well be of survival value and favored by natural selection, whereas an illusion of stare detection would be useless.

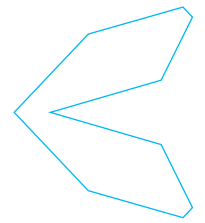
Brugger, like many fellow skeptics, assumes that most people misinterpret their own experiences because they are unaware of their in-built cognitive biases. From this point of view, all the examples we quoted in our paper are fundamental misunderstandings. Most people are wrong about their own experience. However, a small elite, namely those who are enlightened by the materialist worldview, have privileged access to truth. They can see through the superstitions that cloud the minds of scientifically uneducated people, and even of a few misguided researchers such as ourselves. They believe they have escaped from the tyranny of the right brain, cognitive mechanisms underlying the formation and maintenance of paranormal beliefs. They have been liberated by Science and Reason, which are presumably embedded in cognitive mechanisms in the left hemisphere.

In a nutshell, the fundamental question Brugger's (2024) Commentary raises is this: *Is it more scientific to adhere to the materialist belief system and deny all evidence that goes against it, or to explore what we do not understand?*

## REFERENCES

- Brugger P, & Taylor, K.I. (2003). ESP: Extrasensory perception or effect of subjective probability? *Journal of Consciousness Studies*, 10(6-7), 221-246.
- Guterstam, A., Kean, H.H., Webb, Y.W., Kean, F.S., Graziano, M.S.A. (2019). Implicit model of other people's visual attention as an invisible, force-carrying beam projecting from the eyes. *Proceedings of the National Academy of Sciences*, 116(1), 328-333. <https://doi.org/10.1073/pnas.2003110117>
- Pinker, S. (2021). *Rationality: What it is, why it seems scarce,*

- why It matters*. Allen Lane.
- Reber, A. & Alcock, J. E. (2019). Searching for the impossible: Parapsychology's elusive quest. *American Psychologist*, 75(3), 391-399. <https://doi.org/10.1037/amp0000486>
- Schmidt, S. Schneider, R., Utts, J., & Walach, H. (2004). Distant intentionality and the feeling of being stared at: Two meta-analyses. *British Journal of Psychology*, 95(2), 235-247. <https://doi.org/10.1348/000712604773952449>
- Sheldrake, R. (2000). The "sense of being stared at" does not depend on known sensory clues. *Biology Forum* 93, 209-224. <https://www.sheldrake.org/files/pdfs/papers/The-Sense-of-Being-Stared-At-Does-Not-Depend-On-Known-Sensory-Clues.pdf>
- Sheldrake, R. (2003). *The sense of being stared at, and other aspects of the extended mind*. Hutchinson.
- Sheldrake, R. (2020). *The science delusion: Freeing the spirit of enquiry* (2nd ed.). Coronet.
- Sheldrake, R., Overby, C. & Beharee, A. (2008). The sense of being stared at: An automated test on the internet. *Journal of the Society for Psychical Research* 72(2), 65-97. <https://www.sheldrake.org/files/pdfs/papers/The-Sense-of-Being-Stared-At-An-Automated-Test-on-the-Internet.pdf>.

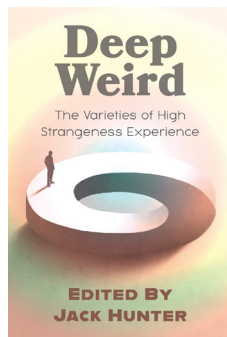


**BOOK AND  
MULTIMEDIA  
REVIEW**

## Deep Weird: The Varieties of High Strangeness Experience

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In modern English, the word “weird” is generally used as an adjective, not a noun. Therefore, to me, the main title of this book, *Deep Weird*, sounds ungrammatical. It could have been rendered better as *Deeply Weird* or *Deep Weirdness*. Or the subtitle could have been used as the main title.

The book presents a collection of seventeen essays. With sixteen of them, there’s just one author per essay; with the twelfth essay, there are two. Details about the contributors can be found on pp. 359-365. Biographical information about Dr Jack Hunter (a Wales-based anthropologist), who edited the book, and Dr Jeffrey Kripal (of Rice University, Houston, Texas), who wrote the foreword, can also be found there.

Following a couple of pages of praise for the book from other authors and then a listing of the book’s contents, there’s Kripal’s foreword. His jargonistic bio on p. 362 indicates, among other things, that he “helped create the GEM Program, a doctoral concentration in the study of Gnosticism, Esotericism, and Mysticism” at Rice University. However, I’ve never heard of a “doctoral concentration” before, and I don’t know why Kripal has capitalized *esotericism* and *mysticism*, which I regard as common nouns. He states that he specializes in the study of “extreme religious states and the re-visioning of a New Comparativism.” In the foreword itself, he contends that *Deep Weird* is ultimately about “our own exoticisation, our own fundamental, irreplaceable, irreducible queerness” (p. 3).

After Kripal’s piece, there’s an introductory section by Jack Hunter, who also displays a penchant for opaque and ponderous jargon. At the top of page 14, there’s a badly constructed sentence by him spanning no fewer than eleven lines. At points, Hunter refers to surrealism, a 20th-century movement in art and literature that aimed at giving expression to the supposed ‘unconscious mind’. But he’s stylistically inconsistent, spelling “surrealist” with both an upper case “S” and a lower case one (pp. 26-27).

According to Hunter, the book suggests “that the ‘highly strange’ might [...] be a central feature of extraordinary experiences more generally” (p. 6). But this comes close to *reification* – treating an abstract quality (in this case, “the highly strange” or “high strangeness”) as if it were a *thing*. He indicates that his favored approach to “high strangeness” is one “that is able to transcend current disciplinary and theoretical boundaries, and entertain multiple concurrent theories and processes” (p. 38). He calls this ‘ontological flooding’. To me, though, it sounds like mushy and vague New Age eclecticism masquerading under a pretentious label.

The 17 essays by the guest authors constitute a very mixed bag. With some of them, the ‘message’, if there really is one, is obscured by convoluted language and the use of unusual and undefined expressions, sometimes occurring within quotations. For example, the reader will encounter: “2D anime style” (p. 96); “death doula” (p. 98); “the omi-

nous luminous voluminous numinous" (p. 171); "fibonacci vortex" (p. 174); "nescience" (p. 178); "classic entoptics" (p. 183); "alterity" (p. 231); "hyperparameter optimisation search heuristics" (p. 267). It seems that some of the contributors went into overdrive to give their writing an "academic" or "literary" gloss!

I shall make no attempt to comment, specifically, on all of the essays in the book. Indeed, weary of swimming through verbal treacle, I gave up completely on a couple of them. However, I found some of the presentations lucid and interesting, such as the first one, titled "Synchronicity" (pp. 49-74). This one is by Sharon Hewitt Rawlette and is a readable and wide-ranging chapter on remarkable coincidences. She cites intriguing case material, including experiences of her own. Some of the cases she mentions bear on the question of survival after physical death. However, given that a tricksterish intelligence may be able to orchestrate phenomena to manipulate our beliefs, I think the only sensible position to take on the survival issue is an agnostic one. In other words, I doubt whether psychical research will ever provide cast-iron proof that consciousness survives bodily death.

Other contributions that I found interesting and readable were Gregory Shushan's one on near-death experiences (pp. 75-88), Michael Grosso's chapter on miracles (pp. 113-128), Zofia Weaver's discussion of physical mediumship (pp. 129-148), and Susan Demeter's essay on conjuring up paranormal manifestations (pp. 317-334).

Zelia Edgar's chapter on "entity encounters" is also readable (pp. 211-225). One of the high strangeness cases that she cites is drawn from Stan Gordon's interesting book *Silent Invasion: The Pennsylvania UFO-Bigfoot Casebook* (2010, pp. 227-244). Omitting some of the details, I'll give just a brief summary. The reported events occurred on October 25, 1973. There was a UFO sighting involving multiple witnesses, including a 22-year-old man whom Gordon refers to as Steve Palmer (pseudonym). Along with two boys, he went to a field on his father's farm, where the UFO seemed to have come down. They saw a huge, white-domed structure with a flattish base. A whirring sound was coming from it, and there was a smell in the air, somewhat like burning rubber. They spotted two hair-covered creatures coming towards them, one of which appeared to be over eight feet tall, the other being about seven feet in height. Palmer fired a couple of tracer shots over them. Regarding the second projectile, the larger creature reached up as if to grab it, at which point the UFO suddenly vanished, leaving a ring of luminosity where it had been. The whirring sound also ceased, and the creatures turned and headed towards a wooded area. Palmer fired three live shots at them, but neither creature showed any sign of having been harmed. Subsequently,

there were more strange occurrences, and that night appeared to mark a turning point for Palmer (now deceased), since he went on to have further paranormal experiences over the years. Edgar gives Palmer's real name as George Kowalczyk, although she doesn't reference her source for this information.

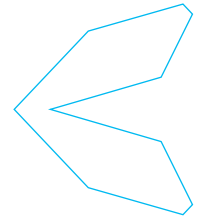
Apart from opaque and pretentious wording, I noticed a few other, albeit relatively minor, problems with *Deep Weird*:

- The book has an index, but it's rather thin.
- On page 154, in a chapter titled "Poltergeists and High Strangeness", Alan Murdie alludes to a well-known poltergeist case in South Shields in the north-east of England. He gives the time span as 2006-2007, but my understanding is that the activity began in late 2005 and ceased before the end of 2006. On page 162, Murdie refers to the famous Scottish physical medium "Daniel Dunglas Hume (1883-1886)". However, although the medium's surname was pronounced as "hume", it was spelled as *Home*, and he was born in 1833, not 1883.
- The aforementioned chapter by Zelia Edgar refers to two books by the late John Keel that were published in 2002. They both appear with "Keel, J. A. (2002)" in the References on page 385, but they should have been clearly differentiated, as "Keel, J. A. (2002a)" and "Keel, J. A. (2002b)". On pages 221-222, Edgar refers to a well-known UFO sighting by a police officer called Alan Godfrey in Todmorden, West Yorkshire, England. Edgar gives the date of his experience as November 28, 1980, but the event occurred during the early morning of the following day.
- In Susan Demeter's essay, the word "illicit" is misused for "elicit" on page 321.

And, more generally, there's a problem with the superscript numbers used throughout the book: they're so small that they can be easily missed. In other words, one can read to the bottom of a page, notice a footnote, and then struggle to find the relevant superscript number in the preceding text.

## REFERENCES

- Gordon, S. (2010). *Silent invasion: The Pennsylvania UFO-bigfoot casebook* (R. Marsh, Ed.). Privately published.
- Keel, J. A. (2002a). *The Complete guide to mysterious beings*. Tor. (First published in 1970.)
- Keel, J. A. (2002b). *The mothman prophecies*. Hodder & Stoughton. (First published in 1975.)



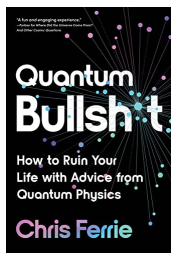
**BOOK AND  
MULTIMEDIA  
REVIEW**

# Quantum Bullshit: How to Ruin Your Life With Advice From Quantum Physics & Farewell to Reality: How Modern Physics Has Betrayed The Search for Scientific Truth

**Henry H. Bauer**

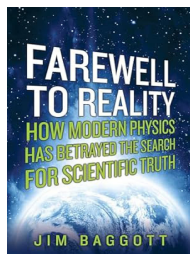
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## CONTEXT AND AUTHOR DISCLOSURES

Ever since I encountered quantum mechanics while studying chemistry, I have felt uncomfortable and culpably ignorant about it, not only because I don't know how to do the calculations but because I simply don't understand such things as "the collapse of the wave function," and Schrödinger's cat which is neither dead nor alive, and the phenomenon of entanglement, to mention just a few of the points.

I regretted my ignorance even more as quantum matters were referred to by speakers at SSE meetings and by authors in the *Journal of Scientific Exploration*. At the same time, I could discern that a host of writings for a general audience invoked quantum matters in ways that were surely inappropriate and intended to impress rather than to expound and explain.

So when it was suggested that I review a book entitled *Quantum Bullshit* (henceforth "QB"), I welcomed that as the opportunity to become enlightened.

But the book immediately made a bad impression when what is presumably the preface bears the title, "What the F\*\*\* is this book?" But I persisted and read the whole book, in which every paragraph is sprinkled with four-letter nouns or their adjectival forms.

I remain puzzled by this, as the author is an apparently acclaimed and successful author of children's books that are published by the same publishing house as QB: "Sourcebooks' mission is to reach as many people as possible through books that will enlighten their lives. **We are an independent, women-led publisher bound together by the idea that Books. Change. Lives.** ... We're proud to be your hometown publisher [bold in original]."<sup>1</sup>

Since QB not only offended in its presentation but also failed to dispel my ignorance about Quantum matters, I looked elsewhere, and came upon the truly excellent *Farewell to Reality* (henceforth FR) published a decade earlier and also reviewed in the following.

## CONTENT OVERVIEW

QB has no table of contents, index, or bibliography, and those lacks are not properly made up for by two-and-a-half pages of end-notes, about half a dozen for each of four (out of eight) of the chapters.

I can only suppose that the book was intended to be written in a conversational style to make it widely accessible, but I doubt that anyone has ever spoken in this fashion. Four-letter words, used appropriately, can surely serve as emphasis; but any such



purpose is lost with such constant repetition.

The substance of *QB* is also entirely disappointing. Chapter 1 purports to explain energy and does so by means of the famous equation  $E=mc^2$ . "It's measurable. It's precise. An ancient life force permeating the universe, on the other hand, it is not. ... [though] The idea of a supernatural energy source survives today ... [and] is demonstrably *nonscientific*, meaning it can be shown to have no basis in reality" (p. 3).

If this were really a conversation, I would ask the author to comment on how exactly this was shown. And what might his opinion be about the "dark energy" presently so beloved by cosmologists?

The apparent intention to keep things simple also leads to wrong statements: "The color with which the thing glows is the same *no matter what it is made of*" (italics in original; p. 5).

No. That is true only of *hypothetical* "black bodies". Were the author a chemist rather than a quantum physicist, he would know that an excellent way of identifying a non-hypothetical substance is by observing the spectrum of colors emitted at sufficiently high temperatures — a spectrum, by the way, whose interpretation was an important result of the development of quantum mechanics.

Chapter 2 is about particle-wave duality.

Chapter 3 is about the uncertainty principle and includes a diatribe against physicists who "earn a lot of money spilling pretentious words and deep thoughts on pages in the hopes of being admired as public intellectuals" by writing popular quantum-physics books like those in "the list in the preface" (p. 74).

But only five titles are cited in that preface, and Ferrie writes, "I've read at least one of these . . . and it wasn't all bad" (p. xiii). Those titles are compared to titles of books on economics; "Notice the difference?"

I confess that I could not understand what this overall difference is supposed to be and to signify. The paired titles are *The Quantum Astrologer's Handbook* and *The Wealth of Nations; Through Two Doors at Once* and *Capital in the Twenty-First Century; Beyond Weird: Why Everything You Thought You Knew about Quantum Physics is Different and Thinking, Fast and Slow; Quantum Enigma* and *Nudge: Improving Decisions about Health, Wealth, and Happiness; Reality is not What it Seems* and *Freakonomics*.

The last section in this chapter is headed "The Real Secret of Quantum Uncertainty — No Jokes This Time". It explains that quantum cryptography is a straightforward application of the uncertainty principle; "Intercepting and reading a message written onto quantum objects, like electrons or atoms or whatever, is a *measurement* . . . the hacker can't actually read the message without forcing a detectable change in the medium it is being transmitted

in. Unlike existing technology, quantum physics makes communication perfectly secure!" (p. 76).

But this does not claim that the hacker cannot read the message, only that its interception will be noticed. That is hardly 'secure communication'. Moreover, I believe that other readers besides myself would like to know how messages can be written onto electrons or atoms.

Chapter 4 is about Schrödinger's cat, though the chapter's title is "That f\*\*\*\*\* zombie cat". Again, I came away puzzled rather than feeling informed; for example, "Once you internalize quantum physics, it's the states of objects in classical physics that seem weird" (p. 87).

Chapter 5 (Faster than f\*\*\*\*\* light) is similarly unenlightening about entanglement, which it would really be good to understand. Chapter 6 quite appropriately denigrates multiverse theories.

Chapter 7, by contrast to the rest of the book, gives a reasonable exposition of everyday applications of quantum theories, including a good description of what a qubit is (p. 159 f.) — it is nice to have since we can expect to hear more about quantum computers and quantum cryptography in the future. And the concluding chapter 8 at last acknowledges that the prime aim of the book was more to expose B\*\*\*\*\* than to expound quantum physics. But there are innumerable types of b\*\*\*\*\* that we need to be on guard against; in my opinion, most advertisements, and perhaps especially those about prescription drugs, are far more dangerous than is misleading appropriation of the term "quantum".

*Farewell to Reality*, by contrast, is a well-written, highly informative account of modern theories in physics.

I have read in many places the caution that what we experience through our senses is not an actual external, objective reality but rather our interpretation of what our senses pick up, a caution often illustrated by Plato's analogy of shadows on the wall of a cave. But I do not recall seeing in other places than *FR* the same caution extended to "scientific" observations.

I had also not learned from other sources that wave-particle duality has actually been demonstrated through wave-like interference effects with objects of dimensions as large as millimeters (p. 55).

*Understanding* something depends on having experience of sufficiently similar things that one's intuitions about it can be reasonably reliable, and Baggott points out that most or perhaps all human beings are unable to have genuinely good intuitions about what physics theorists deal with when "time" is considered to be a "dimension" fully equal in every way to the three dimensions with which we are familiar — let alone the theories that multiply the numbers of purported dimensions.

Physics and science cannot tell us about what things

really are; they can tell us only about “an empirical reality of things-as-they-are-measured” (p. 129). Rather than say, “that was a Higgs boson”, we should say only “that behaved as though it was a Higgs boson”; or even better, “Those observations were what we would have expected from a Higgs boson”.

Part I of *FR* expounds ‘the authorized version’, the contemporary mainstream view. This is an informative exposition of the ‘standard model’, though it makes by no means light reading. Baggott makes quite clear the problems associated with trying to gain an *intuitive* understanding of the basic entity of quantum physics, the wave function. Wave-particle duality, described by the wave function, signifies that what we describe as a particle “can have probabilities for being in many different places (although thankfully, it can’t have a unit or 100 percent probability for being in more than one place at a time)” (p. 132).

Part II of the book, “The Grand Delusion”, describes the attempts by theorists to go beyond the standard model with such mathematical ventures as supersymmetry, or a multiple-universe interpretation of quantum theory, or the notion that the universe is somehow a holograph; all of which Baggott terms “fairy tale physics”, in which he includes the so-called “anthropic principle” in which the fact of human existence is taken to say something about the real universe. Baggott is quite forceful in his critique of “intelligent design”, whose *raison d’être* draws on the same non-scientific concept as the strong form of the anthropic principle (pp. 270 ff., 283)

As Part II of *FR* expounds the far-fetched attempts to ascribe some sort of intuitively meaningful physical reality to mathematical structures and equations, I was reminded of Fred Hoyle’s science-fiction classic, *The Black Cloud*, whose denouement suggests that human minds are incapable of understanding the universe in which we think we exist. *FR* illustrates the floundering of fairy-tale physics with such zingers as “The multiverse theory is justified by superstring theory but superstring theory cannot be proved because we live in a multiverse” (p. 230).

Fairy-tale physics may be nothing more than abstract mathematics; or perhaps “the irreducible stuff of the universe (or multiverse) ... [is] information” (p. 235); and the concept of information has very close ties to our concepts of entropy and probability (p. 242 ff.).

Baggott points out that Grand Delusions have been quite ubiquitous, and that “‘cleverness’ . . . is almost a prerequisite” (p. 289), citing Mackay’s classic, *Extraordinary Popular Delusions and the Madness of Crowds* (1941). As Steven Weinberg noted, referring to post-modernist and social-constructivism, “You have to be very learned to be that stupid”<sup>2</sup>. Baggott gives as an example (p. 289 ff.)

the sophisticated mathematics that led to the financial crash of 2008. He also worries that the pontifications of eminent fairy-tale physicists will erode the understanding that *science* deals with *testable* reality (pp. 291-4).

## PROS, CONS, AND THE BOOKS’ CONTRIBUTIONS TO THE LITERATURE

As already made clear, *QB*, to my mind, is a blot on the published literature, whereas *FR* is a highly informative exposition.

That contrast may make appropriate here a reminder of how *unreliable* are the ratings and ‘reviews’ on Amazon.com: *QB* is rated at 4.2/5 on Amazon.com, with 60% of the judgments at the highest possible level, 5-star; the infinitely better *FR* is rated 4.3/5 with 54% of the ratings 5-star.

Baggott’s analytical discussion makes plain that we should always bear in mind that such postulated entities as electrons are *interpretations* so that a defensible and accurate description of reactions involving “electrons” would be, “that was *as though* electrons . . .”. We are not entitled to presume that the real stuff of objective reality consists of things like the particles or waves with which we are familiar. Perhaps, as Baggott suggests, the stuff of reality is *information* — which reminded me that Bob Jahn ventured to suggest some explanations of some of his experimental results in terms of information.

Also worth taking away from *FR* is the reminder that information, entropy, and probability are closely coupled concepts. Perhaps attempts at an intuitive understanding of quantum matters would become better if couched in those terms rather than in imaginary mathematical structures.

One aspect of quantum phenomena that has always bothered me is that those phenomena are supposed to pertain only at some sub-microscopic level. But where is the dividing line of dimensions above which “normal” non-quantum effects are observed? It seems inconceivable that such a sharp discontinuity could be real.

I described this dilemma or conundrum long ago, with reference to electrode potentials and solubility products (Bauer, 1990). All experimental results are consistent quantitatively with the equations or calculations describing these phenomena, and there seems to be no reason to expect or to postulate that these relationships break down at some point when the electro-active species, or the soluble substances, are present in amounts that the equations would calculate as less than an atom or molecule.

Drawing on Baggott’s analysis, this conundrum could be resolved if one habitually used the language of “as

though". Indeed, that is what Martin Fleischmann did when he pointed out that a sufficiently large electrode over-potential (away from equilibrium) would correspond to the sort of pressure environment that subsists in the core of the Sun and would therefore make possible nuclear transformations at ordinary temperatures, what was at first described as "cold fusion"; and which does seem to have garnered impressive empirical support (Goodstein, 1994).

### RECOMMENDATION

Get *FR* and recommend it to others. Warn everyone you know against *QB*.

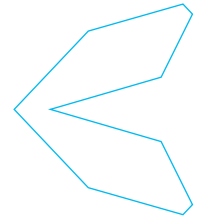
### ENDNOTES

- <sup>1</sup> <https://read.sourcebooks.com/about-us.html>  
<sup>2</sup> *Bull. Amer. Acad. Arts & Sciences* 49 (#3, December 1995) 51-64(at 63).

### REFERENCES

- Bauer, H. H. (1990). Physical interpretation of very small concentrations, *Journal of Scientific Exploration*, 4, 49-53.  
 Goodstein, D. (1994). Pariah science: Whatever happened to cold fusion? *American Scholar*, 63, 527-541.  
 Mackay, C. (1841). *Extraordinary popular delusions and the madness of crowds*. Richard Bentley.

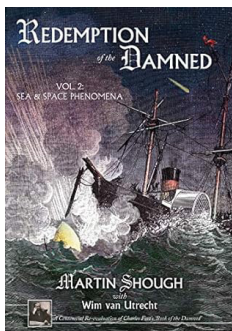




**BOOK AND  
MULTIMEDIA  
REVIEW**

## Redemption of the Damned, Vol 2: Sea & Space Phenomena

Jerome Clark



Redemption of the Damned,  
Vol. 2: Sea & Space Phenome-  
na: Anomalist Books

ISBN: 978-1-949501-18-6

<https://doi.org/10.31275/20242999>

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As one slogs through this exhaustively researched work, one begins to wonder to whom it is addressed, if not a hypothetical reader who will put it down with a sigh of amazement and a shocked realization that *Charles Fort was not a scientist after all*. Does such a soul exist?

If one does, then *Redemption of the Damned Vol. 2*, the follow-up volume refuting Fort's *The Book of the Damned* (1919), will enable that nervous individual to relax. Martin Shough and Wim Van Utrecht have explained all, or nearly all (on infrequent occasions, a concession of failure emerges, softened by the reassurance that "we have found no single case where an exotic explanation is inescapable").

*Redemption 2* is concerned mostly with phenomena that have disappeared from UFO literature, along with dependence on Fort as a primary source. My observation, not the authors', by the way. For ufology, Fort's significance is that in July 1947, American newspapers began citing his and Fortean's attestation that reports of aerial anomalies had not entered the world just weeks earlier; decades ago, somebody had culled reports of such from printed sources and incorporated them into books that remained popular with a tiny, enthralled audience. Thus, Fort played a crucial (albeit hardly immediate) role in the creation of what would eventually be called the extraterrestrial hypothesis, for which many have never forgiven him.

In the late 1940s, Fort was deemed *the* authority on pre-Arnold weirdness for the simple reason that no competition existed. (Well, that and the reality that if one had an off-kilter sense of humor, Fort could be a great comic writer. Lots of people, on the other hand, either didn't get the jokes or were put off by them.) Even so, citations tended to be unspecific. Of the first-generation UFO authors, only one leaned heavily in Fort's direction, M. K. Jessup (d. 1959), whose *The Case for the UFO* (1955) and *The Expanding Case for the UFO* (1957) are based significantly in Fort's cases. It should be noted here that Jessup (mentioned only in passing on pages 52-53 of R2) borrowed Fort's coverage of apparent anomalies in space to argue that long ago, earthly pygmies developed a super-civilization, set up shop between the earth and the moon, and ever since have kept an eye on us. Jessup believed that evidence of this could be discerned, for one instance, in reports of humanoid UFO occupants.

Such ideas died with Jessup, though even in what remained of his life, they caught no traction. Most UFO literature of the time was already focused on atmospheric phenomena, whatever their ultimate origin and nature, on the eminently sensible grounds that things in the sky or nearer were easier to draw conclusions about ("easier" being relative, of course). Curiosities in space were left, with the occasional exception (usually perceived luminosities on the surface of the moon or Mars), solely to astronomers. Sadly, all but a handful of the latter who couldn't resist the temptation to speak out on

UFOs followed Harvard's arch-debunker Donald H. Menzel into the far reaches of the disbelief tradition, from which dead-end science may only now be emerging, if reluctantly.

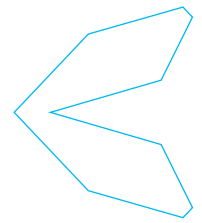
So, once more, whom is *R2* for, if not ufologists? Perhaps historians of astronomy engaged in the study of arcane, largely forgotten controversies in the discipline. That, obviously, is a perfectly valid topic for intellectual scrutiny. It is unfortunate that Shough and Van Utrecht got sidetracked into an assault on Fort, an effort that would have made more sense in the middle of the last century when he was seen less as a literary figure and philosophical jokester than as a credible chronicler of cosmic mysteries. Or, one might observe, before UFO historians had done their own probing into primary historical accounts and drawing their own, more sophisticated conclusions. Ironically, Shough is co-author (with Chris Aubeck) of *Return to Magonia: Investigating UFOs in History* (2015), which is far and away the finest treatment of the subject. Beyond that, there are the late William R. Corliss's many compilations of source materials from the scientific literature. As a chronicler of the long-ago unexplained, in other words, Fort has long been superseded.

Where *R2* is concerned, anyone who is not an anomalyphobe (as Van Utrecht, a prominent Belgian debunker, appears to be) will enjoy chapters such as the one detailing the search for the non-planet Vulcan, a cogent example of the fallibility of scientists, a subject in which

Fort (fairly and unfairly) delighted and which led to the writing of four iconoclastic volumes between 1919 and 1932. On the other hand, anyone who thinks or suspects that by poking his less-than-qualified head into scientific enigmas and disputes, Fort betrayed his limitations will find ample confirmation for that proposition in these pages.

Still, Fort gets the last laugh. The acceleration of scientific knowledge over the past century has done nothing to slow or disturb the persistence of anomalies. To the contrary, all that acceleration has done is to provide us with new tools to investigate them. It's also made them more impenetrable, all the while reminding those who've heard of Fort to reflect on how weird this world can be if one dares to look. These days, there are suggestions, from respectable academics no less, that understanding is more likely to be gleaned not from relatively ordinary anomalies but from those most radically in defiance of prosaic accounting [see, for example, Jack Hunter's (2023) impressive collection of scholarly papers, *Deep Weird: The Varieties of High Strangeness Experience*].

To paraphrase the famous opening words of *Book of the Damned*, a procession of the damned continues to march. In common with the pioneering scientists he lampooned, Fort may have gotten many of the details wrong (and *R2* is a useful compendium of those), but in the end, he got the essential point right.



**BOOK AND  
MULTIMEDIA  
REVIEW**

# Paranormal Ruptures: Critical Approaches to Exceptional Experiences

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Approaches to Exceptional  
Experiences: Beyond The Fray  
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This book, edited by Assistant Professor of Psychology at the University of West Georgia, Jake Glazier, contains ten chapters, a preface, and an introduction. According to the title, the aim is to join two fields: *critical theories* and *exceptional experiences*. I am more familiar with the latter, so I was more surprised by the critical approaches. I do not think there are a lot of readers who master both sides; therefore, a great quality of the book is that it creates that connection. It can become the first of a long series of bookstore' UFOs.

The preface by Robin Wooffitt is based on his own story: How a teenager with huge questions about the boundaries of reality went to a sociology department (and became a great professor there) even while the door seemed close to research into the "paranormal." Although some other psychologists succeed in embracing this liminal field, Wooffitt captures how social and human sciences are necessary to give the full picture of what is going on with such intimate experiences interpreted as paranormal, supernatural, or anomalous.

In his introduction, Jake Glazier lists some contributions from critical theories to exceptional experiences but shows there are only a few, and more are expected. "These forays, while laudable, nonetheless, pale in comparison to the impact that critical theory has had on the social sciences (Parker, 2015), cultural studies (Fuery & Mansfield, 2000), and the academy more generally (Lyotard, 1984)." He discussed such authors as Deleuze and Guattari, Haraway, Derrida, Abraham, and Torok, who offer potential entries into the book's topic. Unfortunately, I didn't catch where critical approaches begin and end or how authors can be recruited to say something relevant to paranormal tropes. Glazier even concluded by expanding critical theory properly to the paranormal, which is inherently subversive, "insofar as it expands and challenges normative models while, simultaneously, generating fresh ways to understand our co-constitutive relationship with others, importantly including non-humans, and our larger ecosystems." In some ways, the book is about how the paranormal challenges thinking everywhere it is introduced.

On such bases, it is not surprising that the book proceeds forward in many directions. This can be seen as a deficit or as a quality. Readers will always be surprised by the chosen perspectives, which are always original. They have to be really open-minded and curious, as it is unlikely that readers will enter the book with knowledge of all the various subjects, which include Lacanian psychoanalysis, ufology, sasquatch research, exceptional experiences, anthropology, fractals, esotericism, phenomenology, artificial intelligence, and others. The effects created by this multifariousness can induce a kind of discomfort, with some readers likely to develop more affinity with some chapters than with the whole book. However, this provides a kind of *work-in-progress* process in-

side the reader: What subject area or chapter is useful to dig into in order to understand the richness of the world better?

The introduction provides summaries of each chapter, but they are still very technical, merging high-level academic approaches with unusual phenomena. The feeling of being lost or unable to understand where the book is going, the reader may appeal for more reassuring guidance. This is found in the first chapter. Chapter 1, by Jake Glazier, gives five clear subtopics: (1) strategic ontologies; (2) positionality and the experimenter effect; (3) exceptional experiences as subjugated knowledge; (4) minor science and traversing cartographies; (5) and post-media battles over narratives. They are all very relevant despite the cryptic vocabulary, which requires systematic use of a decoder.

“Strategic ontologies” seems a way to subvert “hegemonic ontology” (often in singular). This subversive function is one among those played by parapsychology (Evrard, 2016). “Positionality” brings the “psi experimenter effect” as a huge challenge for (philosophy of) sciences (as explained by Rabeyron, 2020, quoted once in Chapter 4). It is interesting that Glazier focuses on the notion of “hegemony” as that which studies of psi and exceptional experiences are fighting. In Germany, Anna Lux and Sylvia Paleschek (2016) talked about *non-hegemonic knowledge* for parapsychology and other marginalized or rejected forms of knowledge. Alternatively, Glazier refers to Foucault’s *subjugated knowledge*. It can be interesting to read sociologist Michael Schetsche (2013) regarding the social control exerted on exceptional experiences (in general, German researchers’ contributions to the book topic have not been taken into account).

In the same vein, the concept of “minor science” at the periphery of the mainstream replicates the same idea. Glazier describes how the battle playground is also inevitably mediatic (information war). Skeptical Guerrilla on Wikipedia may have been chosen as a good concrete illustration of this (Murphy-Morgan et al., 2021).

Cartographies and transversality are described as critical interventions to scout and represent the terrain before integrating it into our research practices and thinking. This and the conclusion may be connected with “reflexive anomalistics,” the epistemology developed by German researchers for many years (Mayer & Schetsche, 2016). A balance should be reached to be as much interested in modeling “truths” as in identifying research dynamics.

Chapter 2 by David S. B. Mitchell advances the demarginalization of cryptozoology research, another domain inside anomalistics. The author analyzes the data as another kind of “apparition experience” as provided in

the field of parapsychology and exceptional experiences, as they recovered several of their characteristics (like “supernormal abilities of hirsute hunters”). He describes tricksterian entities with violent and sexual goals. The notion of “Simianization of the Other” provides a nice bridge with Lacanian psychoanalysis, which helps introduce the atmosphere of paranoia and fear around these experiences and their study. In some ways, this unusual field can be largely connected with topics discussed in other areas.

Chapter 3 by Jack Hunter resumes the concept of “high strangeness” taken from an anthropological perspective. It is interesting to see layers in the paranormal, where parapsychologists can see ufology as stranger than the phenomena they are studying or the reverse. Beyond these discipline boundaries, every individual has their own “boggle threshold,” as articulated by Renée Haynes (1980). “High strangeness” emerged from ufological research, where it constitutes an ordinal variable that helps categorize observations. This nomad concept is a good example of cross-fertility in anomalistics. Hunter defines high strangeness experiences as *complex paranormal experiences with multiple, often overlapping, contributing factors*. This is totally unspecific; therefore, Hunter refers to a book he recently edited (Hunter, 2023). “Weirdness,” “wrongness,” “peculiarity,” “Oz factor”, are very blurred and relative concepts. Hunter nevertheless found it useful to introduce alternative experiences of existence, like altered states of consciousness, trans-mediumisation, and intersubjective participation. There is a kind of theoretical fecundity for this intermediary domain, thanks to the audacity of the “high strangeness” concept that urges researchers not to avoid but to seek the weirdest things.

Psychology professor Christine Simmonds-Moore explored a new avenue in Chapter 4 with “fractals,” inspired by transpersonal researcher Marks-Tarlow and his collaborators (2020). The literature review is great and shows many entanglements between fractals and psychology. It is a pity she missed how fractals have been used for decades in the experimental psychokinesis research by Walter von Lucadou (Walach et al., 2020), even if his theoretical contributions are mentioned. She shows a huge connection between fractals and liminality, which opens doors to other constructs like transliminality, transubjectivity, and entanglement correlations. Her conclusion explained the goal she pursued:

A fractal lens allows parapsychology to embrace the inherently liminal and fractal-like nature of consciousness and anomalous information transfer (psi) and to promote different ways of exploring and understanding these phenomena. By so doing, this can result in new insights and

provides a framework for making sense of these phenomena, which will facilitate their acceptability and allow us to reclaim the anomalous. Such an approach honors the trickster-like nature of psi phenomena (e.g., Hansen, 2001) that moves away from reifying psi phenomena as objects, researchers as skeptics versus believers, and participants as sheep versus goats and replaces them in their embedded, interconnected, meaningful, and relational context that is based on resonance (self-similarity). In terms of psi research, this implies that there should be less focus on 'finding psi', and rather, more focus on fostering the liminal (fractal) spaces where psi emerges.

Chapter 5 by Claude Berghmans explores the concept of "Thought-Form" through various perspectives, especially esotericism, a knowledge often rejected from "science-prone" anomalistics, parapsychology, and anthropology. The analysis represents a tentative reification of the mind, useful to explain some pervasive good and bad effects (like the energetic existence of trauma in a subtle world), especially explored in alternative therapeutic settings. In this alternative reality, "humans have subtle bodies which represent several energetic layers manifesting themselves in a multidimensional reality." Berghmans covers a large amount of literature and asked for more research on "thoughts-forms" as the topic has not yet been systemically explored in scientific circles.

Chapter 6 by Anastasia Wasko linked parapsychology, psychosynthesis, and the trickster archetype. In my opinion, this chapter is weaker than the others, as always in collective books. The main ideas of psychosynthesis are promoted in an almost uncritical way, deploring how Western science seems not ready to discuss spirituality while there already is a lot of research on this area. Recent research by Francesco Baroni (2023) might have been useful to explore the link with parapsychology.

Timothy J. Beck explores in Chapter 7, "Algorithm Magic and Neurodivergent Belief in a Post-Normal World." This is another conceptual glimpse that associates the paranormal with something apparently unrelated: neurodiversity. But in fact, many people use this new word to promote tolerance, social justice, and alternative ways to identify themselves. This converges when *post-normal* possibilities (Walker, 2021, quoted in the chapter) are said to overlap with traditional conversations about the *paranormal*. It looks like heterodoxies tend to blend together (Evrard, 2014a), as Hansen (2001) has already guessed. A good example can be the Hearing Voices Movement (see Evrard, 2014b), where people subvert psychiatric catego-

ries to promote their own non-normative interpretations of their experiences. The chapter may have been better if the author had chosen one specific case on which to apply his ideas.

Stephen Webley and Peter Zackariasson used Chapter 8 to analyze the aftereffects of the renaming from UFO to UAP. The gain in respectability in ufology seems to introduce internal boundary-work as to "discipline heterodoxies" (Hess, 1992). Thus, a cut is tentatively made between pop culture and serious research. In the same vein, "psi" is differentiated from "paranormal" again and again. This opportunity let the authors apply Lacanian theory to some ufologists and to the field in general and to conclude:

The substitution of "phenomena" for "object" suggests a symbolic transformation, emphasizing a departure from a narrow focus on the materiality of sightings towards a more open-ended exploration of diverse occurrences. This linguistic change reflects a collective effort to broaden our understanding of these phenomena and acknowledge the discursive lack of authority surrounding them.

But even the Lacanian concepts are used in a non-sophisticated way and do not provide important insights.

Chapter 9 by John L. Roberts talked about the film *Ariel Phenomenon*, which depicted an incident in Zimbabwe in 1994, with an exceptional number of witnesses, 62 children, who ranged in age between 6-12, of differing ethnic backgrounds. Group sightings of UFOs/UAPs, particularly those involving children, introduce several questions that solicited a psycho-social model of understanding. The dominant framework offers several hypotheses to account for such anomalies: false memory, memory distortion, heightened levels of fantasy, blurred boundaries between subject and fantasy, dreams and reveries, dissociative disorder, memories screening trauma, and the deception-proneness of children. How do UFO researchers find their way through all these prosaic explanations? Even with such an amount of witnesses? Differences between adults' and children's cognitive and perceptual abilities are then discussed by the various actors and reflect a never-ending debate (Bacon & Ruickbie, 2020).

Christopher Senn is the author of the last chapter, exploring artificial intelligence (AI) through its latest developments and associated scandals. What if the Internet is a living organism? This is a tremendous starter for this chapter. The chapter then explores how various computer engineers claim that AI went much further than what they expected, moving on to Sci-Fi themes of the good

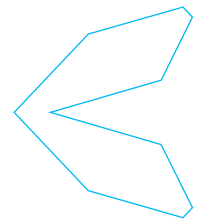
old days (like hive-mind artificial intelligence, new forms of sentience, AI's rights, and human laws). Methodologically, Senn cleverly shows how social sciences can be qualified to discuss natural sciences and technologies:

“C.G. Jung (1991) began his book *Flying Saucers: A Modern Myth of Things Seen in the Skies* by admitting that, as a psychologist, he was not qualified to testify as to whether or not extraterrestrials began invading our world in the 1950s but could only deal with the psychic aspects of ufology. I must similarly confess that I am not qualified to deal with the specifics of modern computer programming languages or the endless nuances of the mind-boggling algorithms of artificial neurons. However, it appears that no one else completely understands them either.”

AI is part of our modern myths and anomalies, and researchers are clearly trained to face them. This chapter is very lively and funny, behind the strong reflections it carries. Just like this book, in the end.

## REFERENCES

- Bacon, S., & Ruickbie, L. (Eds.) (2020). *The cultural construction of monstrous children: Essays on anomalous children from 1595 to the present day*. Anthem Press. <https://doi.org/10.2307/j.ctv20pxz1b>
- Baroni, F. (2023). Introduction. Roberto Assagioli and parapsychology. In K. Sørensen (Dir.), *Psychosynthesis and Parapsychology, 2nd edition* (pp. 9–32). <https://kennethsorensen.dk/en/product/psychosynthesis-and-parapsychology/>
- Evrard, R. (2014a). Heterodoxies' merging: Lacanian approaches to exceptional experiences. *Journal of Exceptional Experiences and Psychology*, 2(1), 5–13.
- Evrard, R. (2014b). From symptom to difference: “Hearing voices” and exceptional experiences. *Journal of the Society for Psychical Research*, 78(3), 129–148.
- Evrard, R. (2016). The orthodoxization of psychology in France at the turn of the 20th century. In A. Lux, & S. Paletschek (Dir.), *Okkultismus im Gehäuse. Institutionalisierungen von Parapsychologie im 20. Jahrhundert in internationaler Perspektive* (pp. 173-199). <https://doi.org/10.1515/9783110466638-007>
- Fuery P., & Mansfield N. (2000). *Cultural studies and critical theory* (2nd ed.). Oxford University Press.
- Hansen, G. P. (2001). *The trickster and the paranormal*. Xlibris Corporation.
- Haynes, R. (1980). The boggle threshold. *Antennae*, 92–97.
- Hess, D. J. (1992). Disciplining heterodoxy, circumventing discipline: Parapsychology, anthropologically. In D. Hess & L. Layne (Eds.), *Knowledge and society vol. 9: The anthropology of science and technology* (pp. 191–222). JAI Press.
- Hunter, J. (2023). *Deep weird: The varieties of high strangeness experience*. August Night Press.
- Jung, C. G. (1991). *Flying saucers: A modern myth of things seen in the sky*. Psychology Press.
- Lux, A., & Paletschek, S. (2016). *Okkultismus im Gehäuse: Institutionalisierungen der Parapsychologie im 20. Jahrhundert im internationalen Vergleich* (p. 433). De Gruyter. <https://doi.org/10.1515/9783110466638>
- Lyotard, J.-F. (1984). *The postmodern condition: A report on knowledge* (G. Bennington & B. Massumi, Trans.). University of Minnesota Press. <https://doi.org/10.2307/1772278>
- Marks-Tarlow, T., Shapiro, Y., Wolf, K. P., & Friedman, H. L. (Eds.). (2020). *A fractal epistemology for a scientific psychology: Bridging the personal with the transpersonal*. Cambridge Scholars Publishing.
- Mayer, G., & Schetsche, M. (2016). On anomalistics research: The paradigm of reflexive anomalistics. *Journal of Scientific Exploration*, 30(3), 374-397.
- Murphy-Morgan, C., McLuhan, R., & Cooper, C. E. (2021, July). Parapsychology's battle for the internet: A critical insight into the Wiki problem. In *Cyberpsychology Section Annual Conference 2021: Future Directions, Challenges and Opportunities in Cyberpsychology*.
- Parker I. (Ed.) (2015). *Handbook of critical psychology*. Routledge. <https://doi.org/10.4324/9781315726526>
- Rabeyron, T. (2020). Why most research findings about psi are false: The replicability crisis, the psi paradox, and the myth of Sisyphus. *Frontiers in Psychology*, 11, Article 562992. <https://doi.org/10.3389/fpsyg.2020.562992>
- Schetsche, M. (2013). Pathologization as strategy for securing the wirklichkeit: The example of paranormal experiences. In M. Dellwing & M. Harbusch (Eds.), *Krankheitskonstruktionen und Krankheitstreiberei* (pp. 271–286.) Wiesbaden: Springer Fachmedien. [https://doi.org/10.1007/978-3-531-18784-6\\_11](https://doi.org/10.1007/978-3-531-18784-6_11)
- Walach, H., Horan, M., Hinterberger, T., & von Lucadou, W. (2020). Evidence for anomalistic correlations between human behavior and a random event generator: Result of an independent replication of a micro-PK experiment. *Psychology of Consciousness: Theory, Research, and Practice*, 7(2), 173-188. <https://doi.org/10.1037/cns0000199>
- Walker, N. (2021). *Neuroqueer heresies: Notes on the neurodiversity paradigm, autistic empowerment, and postnormal possibilities*. Autonomous Press.

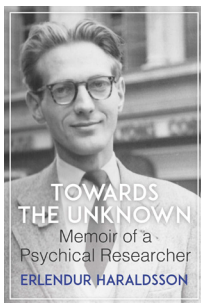


**BOOK AND  
MULTIMEDIA  
REVIEW**

## **Towards the Unknown: Memoir of a Psychological Researcher**

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Research Fellow  
Parapsychology Foundation  
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**Towards the Unknown: Mem-  
oir of a Psychological Researcher:  
White Crow Books.**

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In the Acknowledgments section of this short but valuable book, Erlendur Haraldsson explains that it emerged in response to a request from an Icelandic publisher for his autobiography. He wrote up a list of chapters, asked to be interviewed for each, then read over and expanded the synopses supplied by the interviewer. Sometime later, after an acquaintance translated the book into English, Erlendur once again reviewed the text, deleting and expanding “as I saw fit for a foreign readership” (pp. 177–178). The English-language edition was completed and in production when Erlendur died of cancer at age 89 on November 22, 2020 (Matlock, 2020).<sup>1</sup>

The book is composed of 19 chapters that proceed in roughly chronological order, beginning with Erlendur’s early years. He relates that in childhood he would often walk home from school along the beach. On these walks, he would sometimes “experience tremendous well being as if touched by some powerful divine being,” something that affected him deeply and exercised “tremendous influence” over his life (p. 1). Occasionally, he came into contact with other anomalous phenomena. As a student at the University of Copenhagen, he rented a room in a house where he would hear footsteps, observe object movements, and see the apparition of a man dressed in black. He never mentioned these things to his landlady, passing up the opportunity to investigate them, which he came to regret. Erlendur was introduced to parapsychology by Hans Bender at the University of Freiburg in 1958. Bender subsequently involved him in an experiment in which a psychic provided impressions of eight participants who had made scribbles on sheets of paper. Erlendur easily identified the readings intended for himself and a friend, leaving another profound mark on his psyche.

Erlendur spent a year with J. B. Rhine at the Foundation for Research at the Nature of Man, conducting an experiment with a random number generator brought to the lab by Helmut Schmidt for his doctoral thesis in psychology. Erlendur discovered that he scored as well above chance as the best operators in his experiment. Following the stint with Rhine, Erlendur went to the University of Virginia for a year with Robert van de Castle. While there, he met Ian Stevenson, with whom he was to collaborate on several projects in later years. From Charlottesville, Erlendur went to the American Society for Psychical Research in New York, where he got to know Karlis Osis. When Osis received funds to interview Indian physicians and nurses for a study of deathbed visions, he invited Erlendur to accompany him. The result was a classic work, *At the Hour of Death* (Osis & Haraldsson, 1977, 2012), which is still in print.

In Chapters 5 and 6, Erlendur discusses the trance mediumship of Hafsteinn Björnsson. Much of this occurred before Erlendur came into contact with Björnsson, but included drop-in communicators Erlendur reported in journal papers together with Stevenson. One of the most extraordinary episodes involved an instance of Inuit (a lan-

guage unknown to Björnsson) exchanged between a communicator and a sitter. Erlendur also was able to arrange a series of experiments with Björnsson. (For a comprehensive account of Björnsson's mediumship, based on notes left by Erlendur, see Matlock, 2021.) Later (in Chapter 16), Erlendur recounts his research on the early 20th-century medium Indridi Indridason, about whom he co-authored a book (Haraldsson & Gissurason, 2015). Although principally a physical medium, Indridason at one point brought through a communicator (identified by Erlendur through archival research) who correctly described a fire in Copenhagen, although news of the event did not reach Iceland until several weeks later (Haraldsson, 2017).

With Osis in India in the 1960s and 1970s, Erlendur became acquainted with Sai Baba. Although Sai Baba refused to engage in controlled tests, Erlendur returned to India repeatedly to interview witnesses to his feats and wrote another book about them (Haraldsson, 1987, 2013). In the late 1980s, Stevenson asked Erlendur if he was interested in participating in an attempt to "replicate" his research on children's past-life memory claims. Erlendur proceeded to study cases in Sri Lanka, Lebanon (among the Druze), and Iceland. He conducted the first major psychological studies of children with past-life memories, comparing them to their peers without such memories, and investigated the retention of past-life memories into adulthood. Erlendur published several journal papers on his reincarnation research, summarized in *I Saw a Light and Came Here* (Haraldsson & Matlock, 2016). In addition to his field research abroad, he conducted two major surveys of psychic experiences in Iceland, one on after-death contacts, reported in *The Departed among the Living* (Haraldsson, 2012).

In Chapter 17, Erlendur discusses his career at the University of Iceland. From 1974 to 1993, he taught required courses on experimental psychology, psychological testing, and research methodology, along with two elective courses on parapsychology and altered states of consciousness. From 1993 to 1995, he took leave to visit the Institute for Frontier Areas of Psychology and Mental Health in Freiburg, but when he returned to Reykjavik, he discovered that his courses had been assigned to someone else. He retired from the university in 1999, three years before it was mandatory, and devoted himself full-time to research, writing, and lecturing. The penultimate chapter treats personal affairs, including his family life and academic colleagues. In the final chapter, "Looking Forward to the Unknown," Erlendur reflects on his life's work.

Between Chapters 9 and 10, there are several pages of photographs. Most are personal, showing Erlendur with his parents, his spouses, and his most influential

colleagues, Hans Bender, J. B. Rhine, Ian Stevenson, and Karlis Osis. Only a few photographs relate to his many field investigations—one shows him with Sai Baba and another with Purnima Ekanayake, the subject of one of his reincarnation cases. A bibliography at the end of the book (pp. 168–176), organized by chapter, lists many of his journal publications, as well as his books.

Erlendur's narrative is complemented by a Foreword by Leslie Kean and an Epilogue by Carlos Alvarado. Besides reminiscing about Erlendur, Kean, and Alvarado, note the breadth of his investigations. Not only did Erlendur delve into an array of topics concerning postmortem survival—deathbed experiences, apparitions, mediumship, reincarnation—he approached them not only through fieldwork but also through survey questionnaires, experimental studies, and archival research. Few parapsychologists have demonstrated command of such a range of subjects and methodology.

This book gives a good sense of Erlendur's diverse contributions to parapsychology, but it does not constitute a definitive autobiography. Perhaps because he judged the topics of little interest to readers, Erlendur says little about the journalism that interrupted his graduate school years and mentions only in passing his activities with the Kurds (about which he wrote his first book, never translated into English). An account of these may be found in his chapter in the second volume of Rosemarie Pilkington's *Men and Women in Parapsychology: Personal Reflections* (Haraldsson, 2013), which also describes more of his psychic experiences in his formative early years. For a briefer general treatment of Erlendur's life, see his *Psi Encyclopedia* biography (Matlock, 2020).

## ENDNOTE

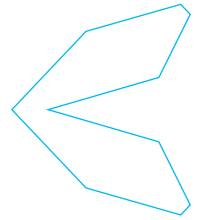
- <sup>1</sup> For the record, although I contributed a paragraph to a section headed "Praise for Erlendur" in the opening of the book, a brief excerpt of which appears on the back cover, I was not involved in the book's composition, editing, or production.

## REFERENCES

- Haraldsson, E. (1987). *Miracles are my visiting cards: An investigative report on psychic phenomena associated with Sathya Sai Baba* (1987). Century Hutchinson. [U.S. edition, *Modern miracles: An investigative report on psychic phenomena associated with Sathya Sai Baba*, 1987, Fawcett Columbine. Updated ed. 1997, Hastings House. Reprinted 2013 as *Modern miracles: Sathya Sai Baba: The story of a modern day prophet*, White Crow Books.]



- Haraldsson, E. (2012). *The departed among the living: An investigative study of afterlife encounters*. White Crow Books.
- Haraldsson, E. (2013). The question of appearance and reality. In R. Pilkington (Ed.), *Men and women in parapsychology: Personal reflections, Volume 2* (pp. 162–173). Anomalist Books.
- Haraldsson, E. (2017). Possible evidence of survival. In L. Kean, *Surviving death: A journalist investigates evidence for an afterlife* (pp. 294–304). Crown.
- Haraldsson, E., & Gissuarson, L. R. (2015). *Indridi Indridason: The Icelandic physical medium*. White Crow Books.
- Haraldsson, E., & Matlock, J. G. (2016). *I saw a light and came here: Children's experiences of reincarnation*. White Crow Books.
- Matlock, J. G. (2020). Erlendur Haraldsson. *Psi Encyclopedia*. <https://psi-encyclopedia.spr.ac.uk/articles/erlendur-haraldsson>
- Matlock, J. G. (2021). Hafsteinn Björnsson (medium). *Psi Encyclopedia*. <https://psi-encyclopedia.spr.ac.uk/articles/hafsteinn-bj%C3%B6rnsson-medium>
- Osis, K., & Haraldsson, E. (1977). *At the hour of death*. Avon Books. [Reprinted 2012, White Crow Books.]



LETTER TO THE  
EDITOR

## Commentary on Near Death Experiences: Greyson (2023)

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In his recent paper on negative or distressing Near-Death Experiences (NDEs), Greyson (2023) argued that the fear of losing or dissolving one's ego (p. 692) relates to having "inverted" (or distressing) NDEs but also mentions that going through that distress may result in the more typical pleasant NDE type, consistent with the notion of "hybrid" positive and negative NDEs (Melloul Ait et al., in press).

While reading his paper, I was reminded of a puzzling pattern in a study of hypnotic virtuosos (Cardeña, 1988). My sample of selected (for high hypnotizability) participants reported some unsuggested, spontaneous phenomena were similar to those reported in NDEs (Cardeña, 2005) both in content (e.g., bright lights, tunnels) and positive emotionality (e.g., bliss). Of the 12 people in the sample, however, two had, at times, very distressing experiences (for instance, one reported being lowered in a coffin, the other having a dream of a man with a knife chasing her), although those showing profiles of likely pathology had been screened out from the experiment. One difference between them and the rest of the sample was that they had the lowest scores in the Barron's Ego Strength Scale (ES; Barron, 1953) of the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1949), which measures resourcefulness and the capacity to adapt (scores of 31 and 41 in comparison with  $M = 49.1$ ,  $SD = 2.60$  for the rest of the participants).

In a study with a general sample, those scoring low in the ES were more inhibited (and dependent) than those scoring higher (Harmon, 1980). With respect to alterations related to psychedelics, Aday et al. (2021) found that those low in openness to experience and with preoccupied, apprehensive, or confused states of mind were more likely to have adverse reactions. Thus, across different contexts (NDE, hypnosis, and psychedelics), those with more rigid, apprehensive, inhibited, and/or confused tendencies tend to experience potentially positive experiences as distressing.

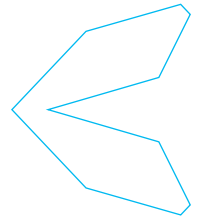
This apparent pattern requires a thorough investigation into varying types of alterations of consciousness as it might help us understand different types of reactions. Furthermore, testing whether these observations relate to the unresolved state of mind in attachment-related trauma (e.g., Gander et al., 2020) might expand these considerations into developmental psychology.

### REFERENCES

- Aday, J. S., Davis, A. K., Mitzkovitz, C. M., Bloesch, E. K., & Davoli, C. C. (2021). Predicting reactions to psychedelic drugs: A systematic review of states and traits related to acute drug effects. *ACS Pharmacology & Translational Science*, 4(2), 424–435. <https://doi.org/10.1021/acspsci.1c00014>
- Barron, F. (1953). An ego-strength scale which predicts response to psychotherapy. *Jour-*



- nal of Consulting Psychology*, 17(5), 327–333. <https://doi.org/10.1037/h0061962>
- Cardeña, E. (1988). *The phenomenology of quiescent and physically active deep hypnosis*. Unpublished doctoral dissertation. University of California, Davis.
- Cardeña, E. (2005). The phenomenology of deep hypnosis: Quiescent and physically active. *International Journal of Clinical & Experimental Hypnosis*, 53(1), 37–59. <https://doi.org/10.1080/00207140490914234>
- Gander, M., Buchheim, A., Bock, A., Steppan, M., Sevecke, K., & Goth, K. (2020). Unresolved attachment mediates the relationship between childhood trauma and impaired personality functioning in adolescence. *Journal of Personality Disorders*, 34(Supplement B), 84–103. [https://doi.org/10.1521/pedi\\_2020\\_34\\_468](https://doi.org/10.1521/pedi_2020_34_468)
- Greyson, B. (2023). The darker side of near-death experiences. *Journal of Scientific Exploration*, 37(4), 683–698. <https://doi.org/10.31275/20232843>
- Harmon, M. H. (1980). The Barron Ego Strength Scale: A study of personality correlates among normal. *Journal of Clinical Psychology*, 36(2), 433–436.
- Hathaway, S. R., & McKinley, J. C. (1940). A multiphasic personality schedule(Minnesota): I. Construction of the schedule. *Journal of Psychology*, 10, 249–254.
- Melloul Ait, A., Kinnunen, K., & Cardeña, E. (in press). The phenomenology of distressing near-death experiences and their aftereffects. *Journal of Anomalous Experience and Cognition*.



LETTER TO THE  
EDITOR

# Ancientness of New Mexico Human Footprints Confirmed

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One of the perennially most controversial issues in the history of archaeology concerns the age of the human settlement of the Western Hemisphere. In *Journal of Scientific Exploration* 37(1) (JSE), I described recently obtained evidence of the impressive antiquity of humans in the New World. Part of that evidence consisted of human footprints, apparently in association with prints of Pleistocene mammals, in White Sands National Park in New Mexico's Tularosa Basin. These were carbon-dated back to the Last Glacial Maximum, some 21,000 to 23,000 years ago and before iced-in Beringia would have been crossable, suggesting a littoral entry to the New World (Jett, 2023a). Shortly after my note was published, another article appeared, detailing questions recently raised in print regarding the genuineness of at least some of the prints, their association with the mammal tracks, and the dating of these phenomena; I summarized much of this in JSE 37(3) (Jett, 2023b). Now, the original authors have replied to the sceptics' objections concerning time depth (Pigati et al. 2023).

Radiocarbon dating had been accomplished based on *Ruppia cirrhosa* seeds considered to be associated with the tracks. Critics raised the possibility that the seeds carbon-dated older than they actually were, owing to the plants' absorption of old carbon in a lacustrine environment. In response, the original authors carbon-14-dated pollen grains from non-aquatic species from the site. To this, they added optically stimulated-luminescence- (OSL-) dating of associated quartz-sand grains in order to ascertain when the sand grains had been deposited. "Both methods confirm the age of the White Sands footprints as 21,000 to 23,000 years ago." Thus, this site now "may be the most convincing evidence for pre-LGM presence of *H. sapiens* in America" (Philippsen, 2021, p. 37).

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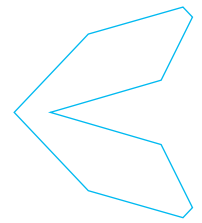


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## REFERENCES

- Jett, S. C. (2023a). Earlier than they thought possible: Very recent findings on the impressive antiquity of humans in the New World. *Journal of Scientific Exploration*, 37(1), 137–140. <https://doi.org/10.31275/20232915>
- Jett, S. C. (2023b). Age of ancient White Sands, NM, human tracks questioned. *Journal of Scientific Exploration*, 37(1), 137–140. <https://doi.org/10.31275/20233159>
- Philippsen, B. (2023). Dating the arrival of humans in the Americas. *Science*, 382(6666), 36–37. <https://doi.org/10.1126/science.adk3075>
- Pigati, J. S., et al. (2023). Independent age estimates resolve the controversy of ancient human footprints at White Sands. *Science*, 382(6666), 73–75. <https://doi.org/10.1126/science.adh5007>





## In Memory of Friederike Schriever

### OBITUARY

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It is unspeakably sad for me, in my capacity as managing director of the Gesellschaft für Anomalistik and as a friend, to honor and mourn a long-time member and supporter of our association – and this only seven years after the much too early death of her life companion Gerd H. Hövelmann.

Friederike Schriever joined the Gesellschaft für Anomalistik, the German sister organization of the Society for Scientific Exploration, in January 2012. At that time, her own research activities in the field of parapsychology and anomalistics were already several years old. She initially studied mathematics, biology, educational science, and psychology at Bielefeld University. One of her professors was Prof. Dr. Oskar Lockowandt (1935–2000), who completed his doctorate in 1966 at the Psychological Institute of the University of Freiburg on the subject of graphology under Prof. Dr. Robert Heiß (1903–1974). At that time, Prof. Dr. Hans Bender (1907–1991) was one of the directors of the Institute of Psychology. Bender was an enthusiastic advocate of research into paranormal phenomena, gave lectures on this subject to large audiences, and had already gained a public reputation as an expert in this field by this time. Lockowandt was obviously not unaffected by this enthusiasm and aroused the interest of his student Friederike Schriever in these topics, who, with her own skepticism, asked how such elusive phenomena could be scientifically investigated at all. Lockowandt said: “Why don’t you go to Professor Bender in Freiburg and do a research internship at the Institut für Grenzgebiete der Psychologie und Psychohygiene [IGPP – Institute for Frontier Areas of Psychology and Mental Health]. Then you’ll see.”<sup>1</sup>

In addition to his work as a university professor, Bender also headed the private IGPP, which was financed by foundation funds. This still existing institute has been dedicated to researching paranormal phenomena and all their various aspects for almost 75 years. In 1984, Friederike climbed the Eichhalde for the first time, the place with the beautiful view over the city of Freiburg, which was also called the “magic hill” by some, where the IGPP was located for the first 50 years of its existence. Friederike, who



was well grounded – after all, she had grown up on a large farm – and in some respects could be described as sober or even skeptical, was not at all sure at the beginning what to expect from the “ghost professor” or “Doctor Psi”, as Bender was sometimes somewhat disrespectfully called. He was very impressed by Friederike’s accuracy, thoroughness, and intelligence and quickly offered her a student assistant position at the institute after her research internship.

Friederike worked at the IGPP from 1985 to 1987 and was significantly involved in two research projects. The first concerned the analysis of so-called truth dreams, i.e., dreams that were later said to have come true. These dream reports were part of a collection of around 3,000 dreams that the German actress Christine Mylius had written down since 1953 and sent to the IGPP, including what she believed to be corresponding later events.

In her precise and critical manner, Friederike analyzed the dreams to see whether the “truth content” or predictive character of the dream content could really be confirmed by subsequent events, but also whether the dreams in which this seemed plausible had a particular structure. This study formed the basis of her diploma thesis entitled “Zur Untersuchung präkognitiver Traumhalte” [On the investigation of precognitive dream content]. The key findings of this work have also been published in two English versions (Schriever, 1987, 1988).

Another important piece of work that Friederike carried out together with psychologist Monika Huesmann concerned the reanalysis of case reports on a total of 54 haunting cases that had been investigated by the IGPP between 1947 and 1986. On the one hand, the research team attempted to statistically record the frequency of certain phenomena and compare them with the values of studies from Great Britain and the USA, and on the other hand, to obtain more precise information about the people affected by hauntings. The importance of this work, which was first published in German in 1989, is demonstrated by the fact that an English translation of the article was published almost two years ago (Huesmann & Schriever, 1989, 2022).

Friederike also presented her research at conferences and international specialist conferences, for example, with five lectures at workshops of the Scientific Society for the Advancement of Parapsychology (WGFP) in Offenburg, partly together with Monika Huesmann, but also in 1987 at the Convention of the Parapsychological Association in Edinburgh and in 1999 at the PA Convention in Palo Alto/California.

Her last major work related to the field of parapsychology was her doctoral thesis entitled “Grenzbereiche der Realitätserfassung” (Border areas of reality percep-

tion), which was published in 1998 as an almost 800-page book. In this extremely elaborate work, Friederike investigated how people who believe in paranormal phenomena differ from non-believers in their reasoning as to why they believe in them (Schriever, 1998, 2000).

Here, we find a combination of three of Friederike’s interests: parapsychology, personality psychology, cognitive psychology, and linguistics. It is no coincidence that she was also a member of the “Society for German Language”. The fact that she has been the owner and director of two language schools for children with reading and spelling difficulties (LOS Institut) for the last 20 years, after gaining experience as a research assistant at the Department of Educational Science at the Free University of Berlin from 1988 to 1993 and at the University of Giessen from 1999 to 2001, seems very logical to me. It also points to the determination with which Friederike was able to pursue her interests and make them concrete.

However, this inevitably led to him turning away from his own research projects in the field of parapsychology, as these could simply no longer be realized due to time constraints. Thus, an obituary written jointly with Gerd in 2004 for the parapsychologist Prof. Dr. Robert L. Morris, who died all too soon, and the co-authorship of a text entitled “The Case History as an Exemplar: The Recurrent Apparitions of Emélie Sagée” on a historical case of strange “apparitions” her last two publications related to parapsychological topics (Hövelmann et al., 2019; Hövelmann & Schriever, 2004). The case of the apparitions of Emélie Sagée had occupied Gerd a great deal, and he had prepared a chapter for an anthology together with two other authors, the completion of which had been prevented by his death. Thankfully, Friederike was persuaded to bring together the existing text sections by Gerd and the two other authors and create a complete text from them, which was then published in 2019.

This shows how much Friederike wanted Gerd’s work to be honored and – as far as she was able – to continue it in his spirit. It is, therefore, easy to understand why she has willingly made the rooms of her LOS Institut available for the annual conferences of the Gesellschaft für Anomalistik since 2018. A conference should have been held there again this year in May, and it is painful that this can no longer be the case. Not only did we enjoy being guests there, but she had also looked forward to these conferences. This was also reflected in the generous care with which she hosted us.

Friederike and Gerd are a story that the international parapsychological community sees as an inseparable unit. The two met through parapsychology, regularly attended international conferences together, and made many friends through their engaging nature. The shock and

dismay of these friends and colleagues was correspondingly great when they learned of Friederike's death. One of them, the parapsychologist Mario Varvoglis, director of the Institut Metapsychique International (IMI) in Paris, shared a personal memory of Friederike with colleagues as a token of his appreciation, which I would like to pass on with his permission. Mario wrote on February 26:

I held both Friederike and Gerd Hövelmann in high esteem – a wonderful couple. Over the last three or four decades, our paths crossed regularly at Bial symposia, EuroPAs and PA congresses, and we always made sure we got to spend some time together. One of my last encounters with Friederike was at PA 2017 in Athens. She was still very affected by the recent loss of her partner, and I found her to be particularly melancholic, even frail. But in some moments, her face lit up again, and you could see the beauty of her soul through the sadness.

Friederike will be missed very much.

## ENDNOTES

- <sup>1</sup> E-Mail from Friederike Schriever to Cedar S. Leverett dated December 4, 2022.

## REFERENCES

- Hövelmann, G. H., Alvarado, C. S., Biondi, M., & Schriever, F. (2019). The case history as an exemplar: The recurrent apparitions of Emélie Sagée. In G. Mayer (Hrsg.), *N equals 1: Single case studies in anomalistics* (pp. 201–231). LIT Verlag.
- Hövelmann, G. H., & Schriever, F. (2004). Der leise Revolutionär: Prof. Dr. Robert L. Morris. *Zeitschrift für Anomalistik*, 4(1–3), 6–13.
- Huesmann, M., & Schriever, F. (1989). Steckbrief des Spuks. *Zeitschrift für Parapsychologie und Grenzgebiete der Psychologie*, 31, 52–107.
- Huesmann, M., & Schriever, F. (2022). Wanted: The Poltergeist. *Journal of Anomalistics / Zeitschrift Für Anomalistik*, 22(1), 76–135. <https://doi.org/10.23793/ZFA.2022.76>
- Schriever, F. (1987a). A 30-year „experiment with time“: Evaluation of an individual case study of precognitive dreams. *European Journal of Parapsychology*, 7, 49–72.
- Schriever, F. (1987b). *Zur Untersuchung präkognitiver Traum inhalte [Diplom-Arbeit]*. Universität Bielefeld.
- Schriever, F. (1988). A 30-year experiment with time: Evaluation of an individual case study performed by the Freiburg Institute for Border Areas of Psychology and Mental Hygiene. In D. H. Weiner & R. L. Morris (Hrsg.), *Research in Parapsychology 1987* (Bd. 7, pp. 96–100). Scarecrow Press.
- Schriever, F. (1998). *Grenzbereiche der Realitätserfassung*. Retriever.
- Schriever, F. (2000). Are there different cognitive structures behind paranormal beliefs? *European Journal of Parapsychology*, 15, 46–67.
- Hövelmann, G. H., Alvarado, C. S., Biondi, M., & Schriever, F. (2019). The case history as an exemplar: The recurrent apparitions of Emélie Sagée. In G. Mayer (Hrsg.),

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Contributions can be empirical research, critical or integrative reviews of the literature, position papers, policy perspectives, or comments and criticisms. Studies can adopt diverse methods, including qualitative, ethnographic, historical, survey, philosophical, case study, quantitative, experimental, quasi-experimental, data mining, and data analytics approaches.

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Primary research or interesting and important theoretical papers that foster the diversity and debate inherent to the scientific process. This entails novel or innovative ideas that have some 'fragmentary' experimental or empirical support but which can be evaluated with logic and open-mindedness to present academia with provocative hypotheses that would otherwise be rejected by most conventional journals. Additional requirements are as follows:

1. All empirical results that have not been replicated should be called 'preliminary' with the findings treated as such. Peer-review and publication priority will be given to studies that are (a) pre-registered or (b) replications. Note that 'replication' can involve repeating the research procedure in a (nearly) identical separate study to be reported within the same paper (e.g., 'Study 2: Replication'). Or, large datasets can be divided randomly into 'Training' and 'Test (or Validation)' sets, i.e., the research findings presented are those results that replicated in the Test set.
2. To promote stricter transparency and context for readers, all analyses where appropriate should provide effect size statistics in the form of direct percentages of either *association* (correlative analysis) or *mean percentage differences* (ANOVA, *t*-tests, etc.). In the case of correlative analysis, reported results shall report  $R^2$  to provide a covariance percentage estimate. Mean tests shall provide a 'percentage change' indicating the actual percentage change between groups (e.g.,  $M = 3.44$  Group 1 versus  $M = 4.02$ , in Group 2, on a five-point scale is calculated by the following:  $ABS [M_1 - M_{2/5} (\text{scale range})] = 11.6\%$  shift or change in means). Standard effect statistics also are allowed, so long as the above percentage techniques are likewise reported. These statistics should be reported in results as 'percentage effect' and follow immediately after standard statistical analysis notation. For correlation, ( $r = .43, p < .01$ , percentage effect = 18%), for means tests ( $M_1 = 3.44$  versus  $M_2 = 4.02, t = 3.443, p < .01$ , percentage effect = 11.6%).

### B. SYSTEMATIC, NARRATIVE, AND SCOPING REVIEWS (12 K WORDS MAX)

All meta-analyses and systematic reviews should include a PRISMA flow diagram to clarify for readers how the exclusion/inclusion criteria were applied to create the literature set under consideration: See <http://www.prisma-statement.org/>

### C. BRIEF REPORTS AND RAPID PUBLICATIONS (2K WORDS MAX)

These are usually pilot studies, direct or conceptual replication attempts of previous work, case studies, brief evaluations, reviews, or 'citizen scientist' efforts that are unique, first-time reports, with no more than two tables and/or figures and 10 references. This rapid publication option is especially appropriate for graduate-level student studies, pilot or preliminary research, or descriptions of important new methods or instrumentation. These reports are subject to blinded peer review in the same manner as research articles. Authors should follow all requirements for longer manuscripts when submitting Brief Reports, including that they have not been submitted or published elsewhere.





## D. BOOK AND MULTIMEDIA REVIEWS (2K WORDS MAX)

Structured for readability and utility in which the content is suitably contextualized and includes links to general model-building or theory-formation in the respective domain(s). Please use the following headers, or otherwise incorporate these themes into the review: (a) Author Disclosures; (b) Content Overview; (c) Pros, Cons, and the Book's Contributions to the Literature; (d) Recommendation; and (e) References (if applicable). For an example, see: <https://www.spr.ac.uk/book-review/poltergeist-night-side-physics-keith-linder>

Multimedia reviews can cover films, documentaries, recorded presentations or symposia, video series and reports, websites that are comprehensive resources, software for scholars, and even peer-reviewed articles in other journals that are pertinent to frontier science. Submissions are now being accepted, and authors should note that these multimedia reviews should include four components: (a) Introduction; (b) Summary of the Media Content; (c) Description of the Value of the Media to the *Journal's* Readership; and (d) Critique of the Media. These components need not constitute major sections, but each issue should be clearly addressed in the submission. We strongly encourage prospective authors to discuss their topic for a multimedia review with the subsection Editor P. D. Moncrief ([pdmoncrief@yahoo.com](mailto:pdmoncrief@yahoo.com)) prior to submission.

## E. ESSAYS (8K WORDS MAX)

Important conceptual or philosophical commentaries, observations, or arguments to spark constructive discussion or debate relative to theory, methodology, or practice.

## F. LETTERS TO THE EDITOR (1K WORDS MAX)

Must address substantive issues relative to recently published content in the Journal.

**SUBMISSIONS (A) TO (C) AND (E) AS APPROPRIATE, MUST ALSO INCLUDE THE FOLLOWING SECTIONS:**

1. **Highlights (i.e., lay summary) (50 words max).** Placed at the beginning of the article before the scientific abstract, this is a short—1 to 3 sentences—bottom-line description of the paper. Avoid technical terms and prepare the comments akin to a published quote to a non-specialist or uninformed journalist or student about the researchers' interpretation of the main results.
2. **Implications and Applications (~150 words max).** Placed immediately after the Discussion section to succinctly summarize or suggest how the study's methods or findings can potentially inform the study of other issues, anomalies, or fields of study, including interdisciplinary and multidisciplinary approaches.
3. **Author Contributions (Contributor Roles Taxonomy).** Please include this information within or following the Acknowledgments section. Follow standard guidelines such as this one from Elsevier: <https://www.elsevier.com/authors/policies-and-guidelines/credit-author-statement>. Also, please include ORCID numbers for authors where possible (on the online submission page).
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